THE OHIO STATE UNIVERSITY

College of Engineering

142 Hitchcock Hall
2070 Neil Avenue
Columbus, OH 43210-1278

MEMORANDUM

To: Randy Smith, Vice Provost, Office of Academic Affairs
Jay Hobgood, Chair, Council on Academic Affairs

From: Stu Zweben, Associate Dean, College of Engineering

Date: November 20, 2009

RE: Proposal to Merge Aerospace Engineering and Mechanical Engineering

On November 12, 2009, the faculty of the College of Engineering voted unanimously to endorse the attached proposal to merge the Department of Aerospace Engineering and the Department of Mechanical Engineering, creating a Department of Mechanical and Aerospace Engineering. This vote followed a similar unanimous vote by the College Committee on Academic Affairs (see attached letter from the CCAA secretary). On behalf of the College, I hereby forward this proposal for consideration by the Council on Academic Affairs.

The College strongly supports this proposal, as evidenced by the faculty vote. Interim Dean Washington also strongly supports it. Please advise me if you need any further information. We look forward to prompt consideration of this proposal by CAA.

Cc: Greg Washington, Interim Dean
Clark Mount-Campbell, Chair, College Committee on Academic Affairs

THE OHIO STATE UNIVERSITY

College of Engineering

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Date: 5 November 2009

To: Stu Zweben
College Secretary, College of Engineering

From: Ed McCaul
Secretary College Committee on Academic Affairs (CCAA)

Subject: Aerospace and Mechanical Engineering Reorganization Proposal

Attached is the Reorganization Proposal to Merge the Aerospace Engineering Department and the Mechanical Engineering Department into a new department called The Department of Mechanical and Aerospace Engineering along with documents discussing CCAA's concerns and how the committee's concerns were resolved. CCAA voted on the 5th of November by a vote of 12 approved, 0 opposed, and 0 abstentions to endorse the proposal to the College of Engineering faculty. As a result, the proposal is being sent to you so that you can arrange for the college faculty to vote on it. If you have any questions about CCAA's actions please let me know.

REORGANIZATION PROPOSAL

to

Merge the Aerospace Engineering Department

and

The Mechanical Engineering Department

into a new department called

The Department of Mechanical and Aerospace Engineering

Version 1.7

November 18, 2009

TABLE OF CONTENTS

Section **Page**

Table of Contents i
Support letter, Mike Benzakein, Chair of Aerospace Engineering ii
Support Letter, Cheena Srinivasan, Chair of Mechanical Engineering iv
Support Letter, Gregory Washington, Interim Dean of Engineering vii
Memorandum of Understanding between Merged Departments and Dean ix
Voting Results xi

Proposal to Merge Aerospace and Mechanical Engineering 1

- Executive Summary 1
- Background 2
- Rationale for Merger 4
- Rationale for Including "Aerospace" in the Department Name 5
- Research in AE and ME 5
- Teaching in AE and ME 5
- Department Governance 13
- Effect of Merger on Untenured Faculty 15
- Effect of Merger on Size of Aerospace Faculty 15
- External Advisory Committees 15
- Faculty Profiles 15
- Professional Service 16
- Effect of Merger on Students 17
- Staff Issues 18
- Space Issues 18
- Fiscal Issues 19
- Impact on Diversity 20
- Impact on External Constituencies Including Alumni 21
- Impact on Academic Freedom and Responsibilities 21
- General Information on the Aerospace Engineering and Mechanical Engineering Programs 21
- Summary 21

APPENDIX A: Recommendations of Performance Planning Acceleration Task Force 31
APPENDIX B: Report from Merger Study Group 48
APPENDIX C: Dean's Response to Merger Study Group Report 59
APPENDIX D: Departmental Space Assignment Report - Mechanical Engineering 63
APPENDIX E: Departmental Space Assignment Reports - Aerospace Engineering 71
APPENDIX F: Response to Questions from CCAA 75
APPENDIX G: Response to Second Set of Questions from CCAA 82

Support letter

Mike Benzakein, Chair of Aerospace Engineering

THE OHIO STATE UNIVERSITY

Aerospace Engineering

College of Engineering
328 Bolz Hall
2036 Neil Avenue
Columbus, OH 43210-1276

Phone (614) 292-2691
Fax (614) 292-8290

To: Dean Gregory Washington

Date: May 19, 2009

Subject: Merger of the Aerospace Engineering Department and the Mechanical Engineering Department into the Department of Mechanical and Aerospace Engineering.

I hereby support the proposed AE and ME merger into the Department of Mechanical and Aerospace Engineering. The AE department is one of the smallest in the College and needs to grow. With the limited resources available to the College, this will be difficult without redirecting resources from other departments within the College. By merging the two departments, it will be possible to combine resources to strengthen both AE and ME.

The Aerospace Engineering Program will be enhanced at the undergraduate and graduate levels. I believe that the AE graduate program will be considerably strengthened with the collaboration of key faculties from the ME department. In addition, there will be enhanced opportunities for the students in both the AE, ME programs to explore a wider range of options, and the combined faculty will have access to a larger number of the most highly ranked students in the college. In conclusion, I support the merger so does the rest of the AE faculty and I strongly recommend that the merger be approved.

Sincerely,

MJ Benzakein, Ph.D.

Wright Brothers Institute Professor

Chair, Aerospace Engineering

Support letter

Cheena Srinivasan, Chair of Mechanical Engineering

Department of Mechanical Engineering

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MEMORANDUM

From: K. (Cheena) Srinivasan, Chair, ME Department

To: Gregory Washington, Interim Dean, College of Engineering

Date: May 15, 2009

Subject: Letter of support for the proposed ME – AE merger

I am writing to indicate my strong support for the proposal being considered by the College of Engineering for a merger of the Mechanical Engineering (ME) and Aerospace Engineering (AE) departments to form the Mechanical and Aerospace Engineering Department (MAE), and to reiterate the conditions that in my opinion will lead to a successful merger in the long term.

The principal reasons for my support of the merger have also been articulated by the two committees that have studied this issue over the last year, the college's Performance Plan Acceleration Task Force (PPATF) and the AE – ME Merger Subcommittee:

- The two disciplines have significant academic synergies and overlap at the undergraduate and graduate levels, and there are a number of highly ranked departments in the U.S. which house both of these disciplines within merged departmental structures. Another strong indication of the local synergies at OSU is the fact that seven ME faculty members have significant involvement in aerospace engineering research, and many of them are well-known nationally and internationally. A merged department would offer a strong mentoring environment for junior faculty and graduate students involved in aerospace engineering research. The academic synergies would also allow for faculty in the merged department to work collaboratively in teaching courses in the two disciplines, introducing new courses that would be of interest to students in both disciplines and, where appropriate, achieve instructional efficiencies by consolidating courses that overlap strongly in content. Finally, a merger, combined with an active and well-designed communication effort directed at the aerospace engineering community, would raise the awareness of the totality and high quality of aerospace engineering research at OSU and would positively benefit external perception and the standing of the aerospace engineering graduate program, one of the primary motivations for the PPATF's recommendation of the merger. The inclusion of the aerospace engineering discipline in the proposed name of the merged department is a very appropriate and, indeed, essential first step in maintaining program visibility among its stakeholders.
- The compelling reason to consider merging the two departments at this point in time is the reality of constrained financial resources at the college level and the expectation that the college faculty size will not grow in the near term and, in fact, may shrink. Were this not the case, the alternative of investing in a stand-alone aerospace engineering department, without negatively impacting the prospects for other departments in the college, would have been feasible.
- The mechanical engineering graduate program at OSU is a highly ranked program nationally. The benefits offered by a merged department to the ME program are realizable primarily in the long term, and

are the benefits associated with a large size and the higher visibility that an increase in size brings. Implicit in realizing these benefits is the ability to invest the resources that become available to the department in ways that best benefit the merged department. Consequently, the assurance given by you in your response to the AE – ME Merger Subcommittee report, that resources resulting from vacancies in the merged department will be available for reinvestment by the merged department for a period of three years following the merger, is an important prerequisite for the merger to be successful in allowing both disciplines to benefit from the merger. I appreciate your support in this matter.

- I recognize that the merging of two departments, each with its own culture, is a challenge. It is a challenge we have met successfully before, when the Applied Mechanics section merged with our department in 1999. Nevertheless, if the proposed merger is approved, I do expect that this merger will be challenging in different ways. The climate under which the merger discussions take place and the attitude that both parties bring to the merged department are important factors in determining the success of any merger. I am very encouraged, therefore, by the progress made by the AE/ME Merger Committee that prepared the current merger proposal, and the manner in which the two parties worked together to address the issues that came up. The very strongly affirmative votes on the merger in both departments are also positive indicators of the prospects for success of the proposed merger.

Support letter

Gregory Washington, Dean of Engineering

THE OHIO STATE UNIVERSITY

College of Engineering

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To Whom It May Concern:

I enthusiastically support the merger of Mechanical Engineering (ME) and Aerospace Engineering (AE) creating the Department of Mechanical and Aerospace Engineering. There are many advantages to a merged program and they can, in general, be classified in four areas: student benefits, faculty benefits, reputational benefits, and resource benefits. I will list a few benefits here, but this list is far from complete. From the student perspective all students will gain the advantage of interactions with a broader array of faculty and ultimately more course offerings that will count in their major. From a faculty perspective, there will be a larger and stronger pool of undergraduate and graduate students to work with. In addition, there are natural synergies in teaching (overlapping strengths in complementary laboratory classes needed by both groups) and synergies in research (overlapping strengths in disciplinary areas i.e. systems and control) that can be exploited for mutual benefit of both groups. From the perspective of reputation, ME has about six of its core faculty that are essentially AE but are in an ME department and AE has about four core faculty who can easily be ME. Combining these faculty together in one unit will allow each unit (AE and ME) to double count faculty. This added strength should help the rankings of each unit in the long run. Finally from a resource perspective, there is significant "overlap of discipline" in AE and ME. A merger can allow leadership greater flexibility in putting the best resources where they need to be placed.

There are some disadvantages to a merger: managing the transition, dealing with staff issues in both units and short-term reputational concerns. The advantages clearly out weigh the disadvantages in my opinion and the fact that we can do this without a loss in any degree program is admirable.

Sincerely (GW!)

Gregory Washington, Ph.D.
Professor and Interim Dean

Memorandum of Understanding Between Merged Departments and Dean

THE OHIO STATE UNIVERSITY

Department of Mechanical Engineering

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October 12, 2009

Memorandum of Understanding Concerning the Realignment by Merger of the Aerospace Engineering Department with the Department of Mechanical Engineering

This agreement is between the Department of Mechanical Engineering (MEC), the Department of Aerospace Engineering (AE), and the College of Engineering (CoE) who desire to realign AE by merger with MEC to form the Department of Mechanical and Aerospace Engineering (MAE). To support the consolidation, AE, MEC and CoE agree to the conditions listed below. This MOU shall be in force from the date of the agreement until the end of FY13. It will be reviewed during FY13 for possible continuation or revision.

Personnel

1. The merged department will retain all PBA associated with faculty and staff in MEC and AE as described in the Reorganization Proposal dated May 25, 2009, with the exception of that set aside to fund the current AE deficit (which does not come from the MEC budget), and will continue to receive designated funds earmarked for MEC and AE in accordance with CoE policies for distributing these funds. Some of the PBA associated with AE will be used for the administrative leadership of the proposed new Center for Propulsion.
2. When a faculty vacancy occurs in MAE during the period of this MOU, at least 2/3 of the PBA released will be returned to MAE. Should CoE vacancy policies not require withholding 1/3 of released PBA from the vacancy pool, appropriate additional PBA from MEC and AE vacancies will be returned to MAE. MAE will re-invest these resources to realize the anticipated benefits of the merger in terms of stronger MEC and AE programs. PBA initially used for the administrative leadership of the Center for Propulsion will be expected to be re-used for this purpose if that PBA is freed by retirement or resignation.
3. Regular college vacancy credit policies will be applied to MAE following the conclusion of the period noted above.

Programs and Governance

4. MEC and AE undergraduate and graduate programs (MS and PhD) will be maintained and administered within MAE as indicated in the Reorganization Proposal.
5. MAE will have two associate chairpersons, one with primary responsibility for MEC programs and the other with primary responsibility for AE programs, as described in the Reorganization Proposal.
6. Other details on governance of MAE will be implemented as described in the Reorganization Proposal.

Other

7. All discretionary funds including endowments, gifts, scholarships and faculty discretionary accounts associated with MEC and AE will transfer to MAE when the ME – AE merger is approved by the OSU Board of Trustees.
8. Consolidation of MAE faculty, staff, and laboratories in Scott Lab, Bolz Hall, and off-campus research laboratories will proceed as outlined in the Reorganization Proposal. Cash support of up to $270K for relocation and renovation will be provided by CoE.

Approvals:

College of Engineering	Mechanical Engineering	Aerospace Engineering
Gregory N. Washington	K. (Cheena) Srinivasan	Meyer Benzakein
Interim Dean, College of Engineering	Chair, Mechanical Engineering	Chair, Aerospace Engineering

VOTING RESULTS

Merger of Aerospace and Mechanical Engineering into the new Department of Mechanical and Aerospace Engineering

May 15, 2009 (Vote on merger proposal)
Mechanical Engineering Department

30 for, 11 against, 7 abstentions (This tally includes all eligible voters: faculty with nonzero appointments in ME, research scientists, and clinical faculty)

May 15, 2009 (Vote on merger proposal)
Aerospace Engineering Department

12 for, 0 against

November 5, 2009 (Vote on merger proposal)
College Committee on Academic Affairs

12 departments for, 0 against, 0 absent

November 12, 2009 (Vote on merger proposal)
College of Engineering Faculty

The merger proposal was approved unanimously

Proposal to Merge Aerospace and Mechanical Engineering

Executive Summary

This document describes the details of the proposal for the merger of the Aerospace Engineering Department with the Mechanical Engineering Department. The name of the merged department will be the Department of Mechanical and Aerospace Engineering, and the merged department will replace both the original Mechanical Engineering Department and the Aerospace Engineering Department.

One of the recommendations of the College's Performance Planning Acceleration Task Force, issued on January 28, 2009, was to merge the Mechanical Engineering and Aerospace Engineering department, as a means to strengthen aerospace engineering research at OSU. A study group to highlight the pros and cons of the proposed merger between the two departments was appointed by Dean Gregory Washington on March 3, 2009, with membership from both departments. The study group issued its findings on March 18, 2009, and the Dean issued his response on April 13, 2009, in favor of the merger and recognizing the need to study merger implementation details. The potential merger was discussed at several faculty meetings held during winter and spring quarters of 2009. The merger implementation merger committee was established by Dean Gregory Washington on April 21, 2009, to identify the issues associated with the merger and to develop a proposal for a process that would ensure a successful merger. The committee is made of both ME and AE faculty (Igor Adamovich, John Brighton, Joe Haritonidis, Gary Kinzel (chair), and Herman Shen). This proposal gives the background information on both departments, the rationale and motivation for the merger, and the process that we believe will lead to a successful merger. A draft proposal for this merger was presented and discussed at faculty meetings in both Mechanical Engineering and Aerospace Engineering on May 8, 2009. The merger proposal was strongly supported by the voting members of both faculties. The proposal was then submitted to the College Committee on Academic Affairs (CCAA) in June of 2009. The CCAA had several questions which are addressed in Appendices F and G of this proposal. The CCAA voted unanimously on November 5, 2009, to approve the proposal, and the proposal was presented to the full college faculty on November 12, 2009, and approved unanimously by the college faculty.

There are considerable similarities between Aerospace Engineering and Mechanical Engineering. By merging departments, it will be possible to combine resources to strengthen both Mechanical Engineering and Aerospace Engineering. Six of the current tenure-track Mechanical-Engineering faculty members and one research-track faculty member work extensively in aerospace research. After the merger, these faculty members will be departmental colleagues with AE faculty members in a combined department while remaining in a department with "Mechanical Engineering" in the title. Therefore, these same faculty members will have a visibility in both ME and AE communities. Second, the senior faculty in Mechanical Engineering who conduct aerospace research coupled with the current AE faculty can provide stronger mentoring of junior faculty members from a research perspective than can the smaller number of senior faculty in AE alone. There is significant leverage for ME as well in that the total size of the department should, over time, lead to improved ranking and hiring support for future faculty. Overall, it will also lead to improved efficiencies because there is some overlap in the courses and curricula and in the support infrastructure in the two departments. And finally,

there will be enhanced opportunities for the students in both programs to explore a wider range of options, and the combined faculty will have access to a large number of some of the most highly ranked students in the college.

As a result of the merger, the budget and space associated with the original ME and AE departments will be combined as part of the new department. Some investment will be required for renovations and the other costs associated with the required moves. However, when all sources of income and expenses are identified for the two departments, the merger will be essentially revenue neutral in the steady state time period.

After the merger, the offices for all regular faculty and staff members will be in Scott Laboratory, but many of the graduate students and adjunct and emeritus faculty members will have offices in Bolz Hall. Building services and computer facilities will be merged completely.

Mechanical Engineering and Aerospace Engineering will maintain separate undergraduate and graduate programs, and the undergraduate programs will be separately accredited by ABET. A new associate department chair will be responsible for bringing focus to the AE program. Undergraduate student advising will be done by different staff members for each program, but the staff for the two programs will report to the same senior advisor (currently Rosie Quinzon-Bonello). The same will be true for graduate advising and other administrative and technical support functions. By combining spaces, we expect that the total space available will be used more efficiently which should reduce space pressures in both programs. The proposed merger, accompanied by physical consolidation of the faculty members, will increase opportunities for interaction and collaboration and enhance the research reputation of the combined department. Therefore, the Merger Implementation Committee strongly recommends that the merger be approved.

Background

One of the recommendations of the College's Performance Planning Acceleration Task Force, issued on January 28, 2009, was to merge the Mechanical Engineering and Aerospace Engineering department, as a means to strengthen aerospace engineering research at OSU. A study group to highlight the pros and cons of the proposed merger between the two departments was appointed by Dean Gregory Washington on March 3, 2009, with membership from both departments. The study group issued its findings on March 18, 2009, and the Dean issued his response on April 13, 2009, in favor of the merger and recognizing the need to study merger implementation details. The potential merger was discussed at several faculty meetings held during winter and spring quarters of 2009. The merger implementation committee was established by Dean Gregory Washington on April 21, 2009, to identify the issues associated with the merger and to develop a proposal for a process that would ensure a successful merger. The committee is made of both ME and AE faculty (Igor Adamovich, John Brighton, Joe Haritonidis, Gary Kinzel (chair), and Herman Shen). This proposal gives the background information on both departments, the rationale and motivation for the merger, and the process that we believe will lead to a successful merger.

Ohio became the birth place of aviation when the Wright Brothers conceived the idea of and designed the first airplane. OSU is arguably the best location in the U.S. for the aerospace education and research because of its central location with respect to NASA Glenn Research Center (NASA

GRC) 120 miles due north, Air Force Research Laboratory (AFRL) 75 miles due west, and the GE Aviation 90 miles due south, in addition to a multitude of smaller companies with aerospace products, research and development activities. NASA GRC is one of the Agency's ten field centers in the country and is the only NASA center with focus on aero-propulsion. This is an area in which OSU has significant presence and visibility in the country. AFRL at Wright Patterson Air Force Base is the largest U.S. Air Force laboratory that houses the Propulsion and Air Vehicle Directorates among a few others. Again OSU has significant presence and visibility in the country in both areas. GE is the largest gas turbine engine manufacturer in the world. Once again, OSU has very strong ties with GE and has national presence in gas turbine research. Therefore, it is important for OSU to keep its presence and to improve its prominence in the aerospace area. The fact that a major part of aeropropulsion research at OSU is currently located within ME suggests that OSU's national visibility in this area would be strongly enhanced by the proposed merger.

Mechanical engineering is in general a multidisciplinary engineering department with teaching and research in a wide variety of subject and application areas. At OSU, the Department of Mechanical Engineering, which includes a Nuclear-Engineering graduate program, is one of the two largest departments in the College of Engineering with currently 44 faculty members and is one of the four top departments identified for enhanced support in the OSU Graduate School's 2008 Doctoral Program and Assessment Plan. Here the faculty count includes only tenure-track faculty members who have at least a 50% appointment in ME. The 8 Big Ten ME departments (Northwestern, Wisconsin, Minnesota, OSU, Penn State, Michigan, Purdue, Illinois; ordered in terms of number of faculty) all ranked in the top 20 in the 2009 national ranking by US News and World Reports. They have faculty numbering from 25 to 53 based on 2008 statistics. Nuclear Engineering (NE) has a graduate program within the Mechanical-Engineering department, and it offers an undergraduate minor in Nuclear Engineering. At any one time, approximately 40 students are pursuing the NE minor. Faculty in ME and NE are actively engaged in research across a wide spectrum of topics including advanced transportation, energy and environmental quality, materials and manufacturing, micro- and nano-technology, and bioengineering. The department has significant presence and national recognition in a number of these areas. There are several well known and very active faculty in the advanced transportation area who are engaged in aerospace research including gas turbine, flow and aero-acoustic control, gas and plasma dynamics and lasers, and aerodynamics.

The Department of Aerospace Engineering (AE) is one of the smallest departments in the College of Engineering at OSU with currently 10 faculty members. Active faculty members are engaged in research in the areas of turbomachinery, aerodynamics, flow control, aero-acoustics, aero-elasticity, flight dynamics and control, and structural mechanics. There are 5 aerospace engineering departments in the Big Ten, and OSU has the smallest department. Penn State is the next closest in size to OSU AAE with 16 faculty members. Each of the top-ten nationally ranked aerospace departments in the Big Ten (Illinois, Michigan, and Purdue) has over 20 faculty. The Department of Aeronautical and Astronautical Engineering (AAE) at OSU was founded in 1948 and was consistently highly ranked over several decades. While still attracting a strong body of undergraduate students and providing excellent undergraduate education, it has slipped in research activities and ranking since the 1990's. However, as part of a commitment to Aerospace Engineering by the College of Engineering, faculty positions have been provided to AE to replace recent and impending faculty retirements. Specifically, 6 of the 10 current faculty members have been hired since 2005 (4 senior and 2 junior). Furthermore, 1 of the 10 current AE faculty members returned to the department in 2007 after a short transfer to ME. In addition there is a search underway for the John Glenn Chair in Space Propulsion and Power, which is endowed by a generous $10M donation by an anonymous donor (the total endowment is $20M of which $10M is for the John Glenn chair in AAE). Also, the department received funding from the State of Ohio for an Ohio Research Scholar in aeropropulsion as part of the last Ohio Research Scholars initiative. Since 2005, the Aerospace

Engineering Department has significantly increased the level of research funding from external sources. In addition AE has significantly strengthened its external relations with key external stakeholders such as NASA Glenn and General Electric Aviation.

Nuclear Engineering is currently integrated into the Mechanical Engineering Department. Although it does not have an undergraduate program, NE has its own graduate program and offers both MS and PhD degrees. Therefore, after the merger between Mechanical and Aerospace Engineering, the department will offer the following eight degrees:

- BS in Aeronautical and Astronautical Engineering[1]
- MS in Aeronautical and Astronautical Engineering
- PhD in Aeronautical and Astronautical Engineering
- BS in Mechanical Engineering
- MS in Mechanical Engineering
- PhD in Mechanical Engineering
- MS in Nuclear Engineering
- PhD in Nuclear Engineering

Rationale for Merger

In spite of recent additions to the Department of Aerospace Engineering, it remains a small department. The college has limited resources, and to continue to invest in Aerospace Engineering, the college will need to reallocate resources from other units. This will be very difficult to do without redirecting resources from other departments within the college.

On the other hand, as indicated in the background section above, there are considerable similarities between Aerospace Engineering and Mechanical Engineering. By merging departments, it will be possible to combine resources to strengthen both Mechanical Engineering and Aerospace Engineering. This will happen in two ways. First, synergy to support aerospace engineering as a discipline will grow because six of the current Mechanical-Engineering faculty members work extensively in aerospace research. After the merger, these faculty members will be departmental colleagues with AE faculty members in a combined department while remaining in a department with "Mechanical Engineering" in the title. Therefore, these same faculty members will have a visibility in both ME and AE communities. Second, the senior faculty in Mechanical Engineering who conduct Aerospace research, coupled with the current AE faculty can provide stronger mentoring from a research perspective than the smaller number of senior faculty in AE alone. There is significant leverage for ME as well in that the total size of the department should, over time, lead to improved ranking and hiring support for future faculty. Overall, it will also lead to improved efficiencies because there is some overlap in the courses and curricula in the two departments. And finally, there will be enhanced opportunities for the students in both programs to explore a wider range of options, and the combined faculty will have access to a large number of some of the most highly ranked students in the college. A complete discussion of the positive and negative issues associated with the merger is given in Appendices A, B, C, and F.

[1] The AE department name is Aerospace Engineering, but the program name is Aeronautical and Astronautical Engineering.

Rationale for Including "Aerospace" in the Department Name

Aerospace is a well recognized industry in the state and nation, and it forms a significant part of Ohio's economy. In addition, there is a relatively large alumni base that identifies with Aerospace Engineering at OSU. Currently, the aerospace discipline attracts highly talented and motivated undergraduate students and AE graduates are heavily recruited by the aerospace industry. Retaining an identifiable and visible aerospace program within the merged department will continue to facilitate the recruitment of high caliber students, as the students could obtain a dual-degree in both AE and ME to improve their employability when there is a down turn in the cyclical aerospace industry.

Research in ME and AE

Table 1 shows the current research areas in Mechanical Engineering and Aerospace Engineering. The research in Mechanical Engineering spans the range of activities common in mechanical-engineering departments. In addition, seven faculty members (Adamovich, Dunn, Haldeman, Lempert, Samimy, Sutton, and Yu) engage in research that would fit well in aerospace engineering. In addition, four of the Aerospace Engineering faculty members (McNamara, Shen, Yedavalli, and Zhuang) are active in research areas that have a significant overlap with traditional mechanical-engineering research areas. Several faculty members have large, well funded graduate programs and support more than 10 graduate students. The overlapping research interests have already led to some collaboration between the two groups, especially in jet propulsion. Recently, a Center for Propulsion was established in the College of Engineering. It is anticipated that there will be significant participation from faculty members in both mechanical and aerospace engineering to promote the growth of research in propulsion.

Teaching in ME and AE

In conjunction with the proposed reorganization, courses in both departments have been analyzed, and the analysis reveals a commonality of interests, in both the undergraduate and graduate levels. Tables 2 and 3 list the undergraduate required courses and the faculty who have either taught the courses in the past or could teach the courses in the future. There is significant overlap in interest in fluid mechanics, thermodynamics, heat transfer, system dynamics and structures. There is relatively less mutual interest in machine design and manufacturing. The undergraduate elective courses taught by both groups are listed in Tables 4 and 5. The graduate level elective courses taught by ME are listed in Tables 6 and 7, and the NE courses are listed in Table 10. Those taught by AE are listed in Table 9.

It should be mentioned that a limited number of courses in Mechanical Engineering and Aerospace Engineering are similar, and the possibly of combining courses will be investigated after the details of the merger are agreed upon.

After the merger, the teaching assignments will be made by the department chair in consultation with the two associate chairs and the interest-area chairs. It is anticipated that initially the majority of the courses will continue to be taught by the faculty members who have taught them in the past. Teaching quality is a point of pride in both Mechanical Engineering and Aerospace Engineering, and the goal when making the assignments will be to put the most qualified people available in each of the courses taught.

The number of courses taught by individual faculty members will vary depending on the overall activity level of the individual. Faculty members who have limited research and service activities will be assigned more courses to teach than will be assigned to someone with a large research program or service load. Teaching assignments will be made according to the workload policy established for the combined department. It is to be noted that both departments currently have a formal workload policy. While these policies are not identical, they are similar. A common workload policy will be developed when the details of the merger are worked out.

Table 1: Research Interests in Mechanical Engineering and Aerospace Engineering

Research Area	ME	AE
Non-equilibrium Gas Dynamics	Subramaniam, Lempert, Adamovich	
Classical Fluid Mechanics	Selamet, Conlisk, Samimy, Subramaniam, Mazumder, Yu, Sutton	
Computational Fluid Dynamics	Conlisk, Subramaniam, Mazumder, Yu	Chen, Zhuang
Experimental Fluid Mechanics	Samimy, Selamet, Lempert, Sun, Sutton Subramaniam, Adamovich, Haldeman	Haritonidis, Bons
Aerodynamics	Samimy, Conlisk, Yu, Dunn	Gregory, Bons, Chen, Benzakein
Turbulence	Samimy, Sutton	Haritonidis, Chen
Heat and Mass Transfer	Conlisk, Selamet, Subramaniam, Sun, Mazumder, Dunn, Haldeman	Bons, Chen
Thermodynamics	Subramaniam, Mazumder, Guezennec, Sun, Moran, Heremans	
Reacting Flows	Selamet, Subramaniam, Guezennec, Sutton, Mazumder, Yu, Adamovich	
Automotive Systems	Guezennec, Selamet, Rizzoni, Guenther, Singh, Parker, Washington, Wang, Dapino, Kahraman	
Energy Systems	Guezennec, Rizzoni, Selamet, Yu, Mazumder, Sutton	Benzakein, Chen
Nuclear Engineering	Blue, Aldemir, Sun, Smidts	
Tribology	Bhushan	
Dynamics, Vibrations and Acoustics	Parker, Singh, Menq, Selamet, Busby, Washington, Mendelsohn, Samimy, Kahraman	Shen, Zhuang, McNamara, Oz, Benzakein
Controls	Srinivasan, Washington, Rizzoni, Utkin, Singh, Menq, Wang	Oz, Yedavalli
Manufacturing	Kinzel, Altan, Luscher, Menq, Lee, Ghosh Lilly, Srinivasan, Lempert, Dupaix, Walter, Bechtel	Shen
Solid Mechanics	Busby, Parker, Gilat, Harper, Katsube, Dapino, Mendelsohn, Lee, Ghosh, Walter, Dupaix	Shen, McNamara, Oz
Computational Mechanics	Busby, Parker, Bechtel, Katsube, Mendelsohn, Ghosh, Lee, Dupaix, Kahraman, Walter, Luscher	Shen, McNamara, Oz
Experimental Mechanics	Gilat, Harper, Walter, Dapino, Dupaix, Staab	Shen
Advanced Materials, including Composites	Luscher, Washington, Walter, Harper, Bechtel, Ghosh, Busby, Mendelsohn, Staab, Dapino, Dupaix	Shen
Mechatronics	Rizzoni, Washington, Singh, Dapino, Wang, Menq	
Design	Kinzel, Luscher, Harper, Staab, Guenther, Srinivasan, Lilly, Altan, Siston, Kahraman	Shen
Bioengineering	Blue, Guenther, Ghosh, Kinzel, Siston, Menq, Dupaix	
Undergraduate Education	Moran, Staab, Kinzel, Siston, Abrams, Haldeman	Freuler, Haritonidis
Low-speed aerodynamics	Samimy, Conlisk	Gregory
Combustion	Adamovich, Sutton	Benzakein
Electric discharges and plasmas	Admamovich, Lempert	
Compressible fluid mechanics (subsonic to hypersonic)	Yu, Adamovich, Samimy, Haldeman, Dunn	Gregory, Zhuang, Bons, Chen
Viscous fluid flows	Mazumder	Chen
Comp. model. of fluid flows (CFD)	Mazumder, Yu, Haldeman	Chen, Zhuang
Hydrodynamic stability theory		
Airfoil design and testing		Gregory, Freuler, Benzakein
Air-breathing propulsion	Samimy, Dunn, Haldeman	Benzakein, Bons, Freuler, Chen
Aeroelasticity	Dunn	McNamara, Shen, Oz
Structural dynamics of flight vehicles		Oz, Yedavalli, McNamara
Space vehicle design and systems eng.		Oz
Astronautics		Oz, Yedavalli
Flight dyn and flight control systems		Oz, Yedavalli
Jet Engine Test Facilities	Samimy, Dunn	Freuler, Benzakein
Marine & Industrial Gas Turbines		Freuler, Benzakein
Flight mechanics		Yedavalli, Oz
Fatigue and fracture	Ghosh, Mendelsohn, Katsube, Walter	Shen

Table 2: ME Undergraduate Required Courses. Faculty listed are those who have taught the courses since Autumn 2004 and those who could teach the courses in the future.

Class	Title	ME	AE
ME250	Num. Meth. ME	Guezennec, Gilat, Harper, Busby, Yu, Dupaix	Chen
ME410	Statics	AM Faculty+, DM Faculty*, DS Faculty#	Yedavalli, McNamara
ME420	Strength of Matls	AM Faculty+, DM Faculty*	McNamara
ME430	Dynamics	AM Faculty+, DM Faculty*	Yedavalli, McNamara
ME481	Sys. Dyn. Vib.	Blue, Parker, Dapino, Guenther, Wang, Bechtel, Mendelsohn, Kahraman	Yedavalli
ME482	Sys. Dyn. Electro.	Srinivasan, Rizzoni, Blue, Wang, Dapino	Yedavalli
ME500	Intro. Therm. Sci.	Conlisk, Aldemir, Guezennec	
ME501	Thermo. I	Moran, Lempert, Conlisk, Samimy, Guezennec, Mazumder, Adamovich	Gregory, Bons
ME502	Thermo. II	Moran, Aldemir, Conlisk, Guezennec, Adamovich, Heremans	Bons
ME503	Fluid Dyn. I	Conlisk, Bechtel, Samimy, Subramaniam, Yu, Adamovich, Sutton	Gregory, Chen, Haritonidis, Bons, Zhuang
ME504	Fluid Dyn. II	Conlisk, Yu, Subramaniam, Adamovich, Samimy	Gregory, Chen, Haritonidis, Bons, Zhuang
ME510	Heat Transfer	Subramaniam, Selamet, Mazumder, Adamovich	Bons
ME553	Kinem. Dyn. Mach	Kinzel, Siston, Lilly	
ME561	Fail. Stress An.	Busby, Luscher, Harper, Guenther, Staab, Siston, Dupaix	
ME562	Des. Mach. El. I	Busby, Luscher, Staab, Guenther, Siston, Dupaix	
ME563	Des. Mach. El. II	Bhushan, Luscher, Staab, Guenther, Siston	
ME564	Des. Group Proj.	Moran, Luscher, Busby, Aldemir, Staab,	
		Guezennec, Kinzel, Subramaniam, Conlisk,	
ME565	ME Design	Luscher, Siston, Kinzel	
ME568	Sr. Exit Interview	Srinivasan, Kinzel	
ME570	ME Meas.	Rizzoni, Subramaniam, Gilat, Walter,	Yedavalli
		Guezennec, Dapino, Sun	
ME571	Controls	Utkin, Menq, Srinivasan, Dapino, Wang	
ME581	ME Lab	Faculty, Haldeman	

* DM = Design and Manufacturing
+ AM = Applied Mechanics
# SD = System Dynamics

Table 3: AE Undergraduate Required Courses. Faculty listed are those who have taught the courses since Autumn 2004 and those who could teach the courses in the future.

Class	Title	ME	AE
AE 200	Intro to AeroE I		Gregory, Bons
AE 201	Intro to AeroE II		Gregory, Bons
AE 405	Thermodynamics	Adamovich, Lempert	Gregory, Bons
AE 414	Applied Diff Eq	Yu, Subramaniam, Conlisk	Chen
AE 510	Lab (.01-.03)		Shen, Haritonidis
AE 512	Sys. Integration I		Oz
AE 513	Sys. Integration II		Oz
AE 514	Sys. Integration III		Haritonidis
AE 515	Capstone Design I		Gregory, Oz
AE 516	Capstone Design II		Shen, Oz, Gregory
AE 517	Capstone Design III		Oz, Gregory
AE 520	Flight Veh. Dyn.		Oz, Yedavalli
AE 521	Linear Systems Eng.	Gilat, Busby	Oz, Yedavalli
AE 530	1-D Gas Dyn.	Adamovich, Samimy	Chen, Haritonidis, Gregory, Bons, Penko
AE 542	Flight Veh. Stru. I		Oz, Shen, McNamara
AE 543	Flight Veh. Stru. II		Oz, Shen, McNamara
AE 550	Propulsion	Adamovich, Samimy, Sutton	Chen, Bons
AE 560	Fund. of Aero Dym.	Adamovich, Samimy	Chen, Gregory, Haritonidis, Bons
AE 570	Viscous Flow & HT	Adamovich, Conlisk	Haritonidis, Gregory, Bons
AE 580	Anal. Mtds. in AAE		Zhuang
AE 581	Num. Methods	Yu, Gilat, Subramaniam, Conlisk	Chen, Oz, Zhuang

Table 4: ME Undergraduate Electives. Faculty listed are those who have taught the courses since Autumn 2004 and those who could teach the courses in the future.

Class	Title	ME	AE
ME505	Intro. to Nuc. Sci. & Eng.	Hajek	
MEH610	Direct Energy Conv.	Subramaniam	Penko
ME612	Heat Exchangers	Mazumder, Subramaniam	
ME621	Para. Des.	Abrams, Lilly	
ME622	Tool Eng.	Brevick (ISE)	
ME627	Turbomach.	Subramaniam, Korpela, Selamet	Chen, Bons
ME630	En. Int. Comb. Eng.	Selamet, Guezennec, Wang	
ME638	Intro to Ultrasonics	Singh	
ME639	App. Fin. Ele.	Busby, Dupaix, Lee, Ghosh	Shen
ME641	HVAC	Korpela	
ME650	Mach. Dyn. Vib.	Parker, Singh, Kahraman, Dapino	
ME654	Land Veh. Dyn.	Guenther, Wang	
ME662	Composites	Busby, Staab, Dupaix	
ME666	Acoustics	Singh, Selamet, Kahraman	Zhuang
ME672	Controls	Srinivasan, Washington, Dapino, Wang	Yedavalli
ME674	Mechatronics	Washington, Dapino, Wang, Srinivasan	
ME675	Fl. Pow. Sys.	Singh	
MEH680	Sig. Proc.	Singh, Guezennec, Rizzoni, Dapino	
ME682	Des. Manu.	Lilly, Luscher, Siston	
ME683	CAD/CAM	Kinzel, Lilly	
ME687	Bio. Eng.	Siston	

Table 5: AE Undergraduate Electives. Faculty listed are those who have taught the courses since Autumn 2004 and those who could teach the courses in the future.

Class	Title	ME	AE
AE 612	Aircraft Flt. Test		Gregory
AE 615	Intro Comp Aerodyn.		Chen, Zhuang
AE 616	Advanced Aero Dsgn.		
AE 620	Aircraft and Spacecraft Control I (classical)		Oz, Yedavalli
AE 621	Aircraft and Spacecraft Control II (modern)		Oz, Yedavalli
AE 626	Orbital Mechanics		Oz, Yedavalli
AE 645	Structural Dynamics of Flight Vehicles		Oz, McNamara
AE 661			Bons, Haritonidis, Chen

Table 6: ME 7XX Graduate Courses. Faculty listed are those who have taught the courses since Autumn 2004 and those who could teach the courses in the future.

Class	Title	ME	AE
ME701	Gas Dyn.	Samimy, Subramaniam, Adamovich, Sutton	Chen, Gregory, Haritonidis, Bons, Penko
ME702	Adv. Thermo.	Moran, Rich, Subramaniam, Adamovich	Bons
ME705	Fund. Fl. Mech.	Conlisk, Samimy, Subramaniam, Yu	Gregory, Haritonidis, Bons, Zhuang, Chen
ME/NE707	Num. Meth. Part. HT	Subramaniam, Mazumder	Zhuang
ME710	Fund. HT	Mazumder	
ME712	Eng Prin in Mech		Shen, McNamara
ME715	Intro to Fluidics	Conlisk	Haritonidis
ME726	Combustion	Selamet, Sutton	Penko
ME727	Appl. Jet Propulsion	Samimy, Dunn, Haldeman	Bons, Chen
ME730	Int. Combustion Engn.	Selamet, Guezennec	
ME731	Vib. Discrete Sys	Bechtel, Parker, Kahraman, Harper, Dapino, Mendelsohn	Yedavalli
ME733	Analytical Dynamics	Bechtel, Parker, Kahraman, Harper	Yedavalli
ME734	Vib. Continuous Sys	Bechtel, Parker, Kahraman, Harper, Dapino, Mendelsohn	McNamara
ME736	Nuclear Power Plants	Sun	
ME737	HT in Nuc. Eng	Aldemir, Sun	
ME738	Intro. Two-Phase Flow	Sun	
ME740	Elasticity	Katsube, Ghosh, Lee, Harper, Gilat, Busby, Dupaix, Walter	
ME743	Continuum Mechanics	Katsube, Harper, Staab, Walter, Ghosh	
ME744	Fracture Mechanics	Walter, Mendelsohn	
ME751	Comp. Graph. Kinem.	Kinzel	
ME752	Mech. Des. Robots	Menq	
ME753	Elastic Stability	Lee, Ghosh, Gilat, Katsube	
ME754	Land Veh. Lab	Guenther, Wang	
ME555	Plates and Shells	Lee, Gilat, Ghosh	
ME760	Applied Stress Mach.	Kinzel, Luscher	
ME761	Optimization Des.	Kinzel, Busby	
ME762	Composites	Busby, Staab, Harper, Walter. Ghosh	
ME763	Adv. Str. Of Matls	Busby, Walter, Katsube, Dupaix, Ghosh	
ME764	Adv. Gear Des.	Kahraman	
ME765	Tribology	Bhushan	
ME766	Acoustics	Singh, Selamet	
ME767	Lubrication	Bhushan	
ME768	Intro FEM	Lee, Ghosh	Shen
ME770	Meas. Sys. Des.	Washington	
ME771	Des. Fiber Op. Sys.		
ME772	Control Sys Design	Doebelin	Yedavalli
ME773	App. Dig. Cont.	Menq, Srinivasan, Washington, Wang	Yedavalli
ME774	Smart Materials	Dapino	
ME776	Reliability	Aldemir, Smidts	
ME777	Auto. Noise, Vib. I	Singh, Selamet, Parker	
ME778	Auto. Noise, Vib. II	Singh, Selamet, Parker	
ME779	Auto. Noise, Vib. III	Singh, Selamet, Parker	
ME780	Lumped Para. Sys.	Singh, Doebelin, Dapino, Wang	
ME781	Power Train Dyn.	Rizzoni, Srinivasan, Wang	
ME782	Power Train Control	Rizzoni, Wang	
MEH783	Honors Res.	Guezennec, Singh	
ME784	Modeling Hybrid Veh	Rizzoni, Guezennec	
ME785	Control Hybrid Veh	Rizzoni, Guezennec, Wang	
ME787	Biomechanics	Siston	

Table 7: ME 8XX Graduate Courses. Faculty listed are those who have taught the courses since Autumn 2004 and those who could teach the courses in the future.

Class	Title	ME	AE
ME800	Eng. Analysis	Gilat	
ME803	Fund Thermo II	Moran, Rich, Subramaniam, Adamovich, Heremans	
ME804	Fluid Physics	Adamovich	
ME805	Electric Gas Discharges	Adamovich	
ME807	Cond. HT	Mazumder	
ME808	Laminar Conv. HT	Mazumder	Bons
ME809	Radiation HT	Mazumder	
ME810	Inviscid Flow	Walter, Rich, Yu, Adamovich, Conlisk	Chen, Haritonidis, Bons, Zhuang
ME811	CFD	Mazumder, Yu	Chen, Zhuang
ME813	Turb. Flow HT	Samimy, Sutton	Bons
ME814	Optical Tech in Flows	Samimy, Lempert	
ME815	HT in Porous Media	Mazumder	
ME818	Adv. Analytical Methds	Ghosh, Gilat, Conlisk	
ME820	Wave Dyn in Fluids	Selamet	
ME826	Combustion	Selamet, Sutton, Yu	
ME820	Wave Dyn. in Fluids	Selamet	
ME832	Nonlinear Vibrations	Kahraman, Bechtel, Parker	
ME833	Elastic Wave Prop	Parker, Gilat, Bechtel, Mendelsohn	
ME834	Advanced Vibrations	Kahraman, Bechtel, Gilat, Dapino	
ME835	Random Vibrations	Kahraman, Bechtel, Dapino	
ME837	Advanced Tribology	Bhushan	
ME839	Advanced FEM	Ghosh, Lee	Shen
ME840	Cont. Media	Bechtel, Walter, Katsube, Dupaix, Ghosh	
ME843	Advanced Elasticity	Katsube, Gilat	
ME844	Advanced Fract. Mech.	Walter, Mendelsohn	
ME847	Theory of Plasticity	Gilat, Dupaix	
ME851	Kin. Geom. Of Mech	Kinzel, Siston	
ME855	Advanced Shells	Gilat, Bechtel	
ME859	Sliding Mode Control	Utkin	
ME864	Viscoelasticity	Ghosh, Lee, Gilat, Dupaix	
ME870	Dig. Signal Anal	Singh, Rizzoni, Dapino	
ME873	State Space Dyn. Sys	Wang, Rizzoni, Washington, Utkin, Srinivasan	Yedavalli
ME874	Fault Dia Mechtronics	Rizzoni	
ME882	Modeling Dys. Sys	Bechtel, Gilat	
ME890	Metal Forming	Altan	

Table 8: NE Courses. Faculty listed are those who have taught the courses since Autumn 2004 and those who could teach the courses in the future.

Class	Title	ME	AE
NE505	Intro. to Nuc. Sci. & Eng.	Hajek, Blue	
NE606	Radiological Safety	Blue	
NE610	Reactor Safety I	Denning	
NE701	Intro to Nuc. Power Eng		
NE704	Reactor Theory I.		
NE705	Reactor Safety II		
NE707	Num. Methods. In Particle. Diffusion, HT, and Reactor Transport	Mazumder, Conlisk, Guezennec	
NE708	Reactor Theory	Aldemir	
NE710	Reactor Safety II		
NE716	Prob. Reliab. & Safety Anl.	Aldemir	
NE720	Reactor Dyn. and Control	Miller, Aldemir	
NE735	Power Plant Operations I	Hajek	
NE736	Nuclear Power Plants	Aldemir, Sun, Denning	
NE737	HT Appl. in Nuc. Reactor Systems	Sun	
NE738	Intro. to 2 phase flow and HT		
NE742	Nuc. Rad. and Their Measure.	Blue, Miller	
NE743	Nuc. Rad. and Their Shielding	Blue	
NE744	Nuclear Reactor Laboratory	Miller	
NE745	Power Plant Operations II	Hajek	
NE766	Nuclear Engineering Design		
NE771	Radioactive Waste Man.	Maheras	
NE776	Nuclear Fuel Cycles	Hajek	
NE845	Advanced Laboratory Studies	Miller	
NE865	Neutron Slowing Down and Thermalization	Aldemir	
NE880.02	Reactor Kinetics, Dynamics and Controls	Miller, Hajek	
NE880.03	Reactor Design	Aldemir	
NE880.04	Fuel Management		
NE880.05	Radiation Effects	Blue	
NE880.08	Nuclear Instrumentation	Miller, Hajek, Blue	

Table 9: AE 7XX and 8XX Graduate Courses. Faculty listed are those who have taught the courses since Autumn 2004 and those who could teach the courses in the future.

Class	Title	ME	AE
AE720	Stability&Control of Flt.		Oz, Yedavalli
AE745	Aeroelasticity		McNamara, Oz
AE751	Advanced Propulsion	Samimy	Bons
AE752	Rocket Propulsion		Oz, Penko
AE760	Advanced Comp. Flow I	Samimy	Chen
AE771	AeroD. of Viscous Flow		Chen, Bons
AE775	Hypersonic Flows I	Yu	McNamara, Penko
AE800	Deform. and Flow		Oz
AE801	Deform. of Aero Struct.		Oz, Shen, McNamara
AE802	Anal. Methd. in Eng I	Conlisk	
AE803	Anal. Methd. in Eng II	Conlisk	
AE805	Reacting Gas Dynamics		Penko
AE810	Flt. Veh. Perform. Anal.		Oz
AE820	Adv. Flt. Veh. Stb&Con		Oz, Yedavalli
AE842	Adv. Stru. for Flt. Veh.		Oz, Shen
AE844	Opt. Aero. Stru. Design		Oz, Shen
AE851	Adv. Prop. Problems	Haldeman	Bons
AE860	Adv. Topics in Aero		Gregory
AE862	Internal Flows		Bons
AE865	Adv. Visc. Flow Theory	Yu, Conlisk	Bons
AE866	Hydro. Stab. of Fluids		Bons, Zhuang
AE868	Moleculr Flow of Gases		
AE873	Comp. Fluid Dyn.	Yu	Chen, Zhuang
AE875	Intro. to Turbulence	Samimy	Chen, Haritonidis, Bons

Department Governance

Administratively, the Mechanical Engineering Department has a Chair, Associate Chair, Executive Committee, Interest Area Committees, P&T Committee, and miscellaneous other committees which are defined in the following:

1) Interest Areas: Currently the ME department has four interest areas: Dynamic Systems; Energy, Fluid, and Thermal Engineering; Design and Manufacturing; and Applied Mechanics. Nuclear Engineering has its own graduate program, but in terms of representation in the departmental committees, Nuclear Engineering is treated as an interest area.
2) Undergraduate Studies Committee: This committee has representation from each interest area, the undergraduate advising office, the associate chair, and two other faculty members who have expressed a specific interest in the undergraduate program. There is also an undergraduate student representative.

3) ME Graduate Studies Committee: This committee has representation from each interest area in addition to selected faculty members who have a specific interest in the graduate program. There is also a graduate student representative.
4) NE Graduate Studies Committee: This committee is made up of the NE faculty, adjunct faculty, NE graduate program administrator, and a student representative. The NE program has a program chair as well.
5) Promotion and Tenure Committee: This committee is made up of representatives from each interest area in the department.
6) Computer Committee: This committee is made up of the Computer Facilities Manager and faculty members who are heavily involved in computing for education and research.
7) Executive Committee: The Executive Committee advises the chair on administrative matters. It is made up of the chairs from the interest areas, the chairs of the undergraduate and graduate studies committees, the Department Chair, and the associate chair.
8) Other Committees: The ME department has other committees which are established based on special needs, and often do not meet on a regular basis. These include an Honors and Awards Committee, Space and Facilities Committee, Recruitment Committee, and Internal campaign committee.

The interest area membership is self selected by the faculty, and faculty members can belong to more than one interest area. The interest area chairs are voted on annually by the interest-area members. Except where noted, the department chair selects the committee members in consultation with individual faculty members. The department chair also selects the associate chair and all of the committee chairs other than the interest-area chairs.

Administratively, the Aerospace Engineering Department has a Chair, Undergraduate Studies Committee, and Graduate Studies Committee.

As part of the merger, the Aerospace Engineering administrative structure would be merged with that in Mechanical Engineering. The existing interest areas in Mechanical Engineering already encompass the research areas of the Aerospace Engineering program, and so the AE faculty will simply select the interest area(s) in which they wish to participate. Because there will be separate undergraduate and graduate programs, there will be a separate Aerospace Undergraduate Studies Committee and Aerospace Graduate Studies committee. The chairs for the undergraduate and graduate studies committees will be selected from the designated Aerospace faculty by the Department Chair in consultation with the AE program associate chair. After the merger, the AE faculty will also have representation on all of the major committees in the department.

As proposed, the AE faculty will merge with the ME faculty through the interest areas; however, there is a need for the AE program to maintain visibility if their undergraduate and graduate programs are to flourish. This visibility is important both in terms of recruiting and when there is a need to represent the program to sponsors, to the external advisory committee, and to visitors who are specifically interested in the AE program. To provide this visibility, a second associate chair for the department will be appointed. This associate chair will also have general departmental responsibilities and will serve on the Executive Committee. To complement this appointment, the current associate chair will represent the ME program in addition to having general departmental responsibilities. The two associate chairs will be selected by the

department chair in consultation with the faculty members associated with the respective programs.

Effect of Merger on Untenured Faculty

After the merger, the faculty will develop a single policy on Appointment, Promotion, and Tenure (APT). The committee developing the document will have proportional representation from the former departments, and the resulting document will be submitted to a vote of the full, merged, faculty for approval. A two thirds majority vote will be required for approval. In accordance with Paragraph 3.11 of the OAA Policies and Procedures Handbook, for the first two years after the merger (in the case of faculty members to be reviewed for promotion and tenure) or for the first year (in the case of faculty to be reviewed for promotion only), candidates will be given the choice of being reviewed under the P&T guidelines and by the faculty of their previous department or under the P&T guidelines and by the faculty of the merged department. The candidate must make the choice and then acknowledge in writing that, once the review commences under the chosen means, the choice is irrevocable. Regardless of the candidate's choice, the current chair of the merged department will review the case. All faculty members hired after the merger and existing faculty members who are reviewed later than two years after the merger will be reviewed under the new APT document.

Effect of Merger on Size of Aerospace Faculty

The merged department recognizes that, in order to continue to strengthen the aerospace engineering program, it is important to maintain and build upon the group of faculty members associated with aerospace engineering. As vacancies occur among the faculty associated with aerospace engineering and as replacement hires are authorized, the combined department will hire faculty members who also have primarily aerospace engineering interests. In addition, given the significant overlap between mechanical engineering and aerospace engineering, it is likely that some new faculty members hired at other times will have interests in areas that will strengthen the aerospace engineering program.

External Advisory Committees

Currently, both the ME and AE departments have External Advisory Committees, and so does the NE program. After the merger, all three academic programs will retain their advisory committees. It is anticipated that the External Advisory Committees will meet twice each year , with at least one of the meetings being held on the same day for all three programs. Holding one of the meetings on the same day will allow for inclusion of a joint meeting of the three advisory committees to consider department-wide issues.

Faculty Profiles

To compare the faculty composition of a merged ME-AE department with highly-ranked research universities nationwide, a survey of faculty research interests in those universities was conducted by reviewing the web pages for each university. Table 10 summarizes the faculty composition for departments with combined Mechanical Engineering and Aerospace Engineering programs. The faculty are grouped according to the four general interest areas identified in the OSU ME department. The AE faculty have been identified in the appropriate

areas. In some cases, the faculty research areas indicated on the web pages did not fit (for example applied math) in one of the specific areas. In those cases, the faculty members are counted under "other".

As noted, after the merger, OSU will have the largest faculty among the universities considered. The proportion of our faculty in each of the areas is roughly similar to those in the higher ranked, merged departments, but our larger size will allow for greater presence in the technical communities. We do have a slightly larger proportion of our faculty in design and manufacturing than do the other departments. However, this reflects the historically strong design program at OSU and also the presence of manufacturing in mechanical engineering. Except for Florida, neither manufacturing nor design is emphasized at these particular schools.

Given our size after the merger, we will have a relatively large number of faculty members engaged in aerospace research as compared to the universities identified in Table 10. Therefore, we should be well positioned to improve our research rankings in this area in addition to delivering quality education programs in both ME and AE.

Table 10: Comparison of Faculty by Interest Areas in Combined ME-AE Departments

University (Eng College Rkg.)	Total Faculty	Dynamic Systems,	Design and Manufacturing	Applied Mechanics	Fluids and Thermal Sciences	Other (Incl. NE)
OSU (#27)	**56**	**12 (21%)**	**11 (20%)**	**11 (20%)**	**18 (32%)**	**4 (7%)**
USC (#7)	**27**	**6**	**2**	**4**	**15**	
Florida (#25)	**48**	**12**	**7**	**9**	**20**	
Princeton (#18)	**24**	**5**	**1**	**5**	**10**	**3**
UCLA (#14)	**34**	**5**	**4**	**9**	**15**	**1**
Cornell (#11)	**41**	**9**	**3**	**7**	**18**	**4**
Virginia (#37)	**26**	**6**	**1**	**7**	**9**	**3**
Average	**36.6**	**8.1 (22%)**	**4.1 (12%)**	**7.4 (20%)**	**15.3 (42%)**	**1.6 (4%)**

1. Only universities where the aerospace activities are housed within a combined mechanical engineering-aerospace engineering department are included.
2. The data were obtained from university websites and have not been verified separately with the universities.
3. Faculty members with joint appointments in other departments are included. Research scientists and clinical teaching faculty members are not included.
4. Srinivasan and Washington are included in the faculty count for Dynamic Systems

Professional Service

The professional societies in which the current ME faculty members are active can significantly expand the visibility of a merged ME-AE department. In particular, the American Society of Mechanical Engineers (ASME) serves as the primary professional society for ME faculty, but

some of the faculty also belong to the American Institute of Aeronautics and Astronautics (AIAA). The primary professional society for the AE faculty is the AIAA but some of the members also belong to ASME. Therefore, the combined department will have a significant involvement and exposure in both societies. The combined department will therefore, have an opportunity to increase its visibility in both societies through more memberships and chairpersonships on technical committees, journal editorships, symposium organizations, and journal manuscript reviewing. This enhanced exposure should lead to an improvement in peer recognition for the combined department.

Other engineering societies in which AE and ME faculty members render service are the Acoustical Society of America (ASA), American Nuclear Society, (ANS), American Physical Society (APS), the Institute of Electronics and Electrical Engineers (IEEE), the Society of Automotive Engineers (SAE), and the American Society for Engineering Education (ASEE). Mechanical and Aerospace Engineering faculty have had significant involvement in these professional organizations, and a broader participation in society activities by faculty from the unified department will yield long-term benefits to the Department and College.

Effect of Merger on Students

After the merger, the mechanical-engineering students will continue to take courses required for the ME program, and the aerospace engineering students will continue to take courses required under the AE program. No required courses in either program will be canceled as a result of the merger. Also, the student organizations that currently exist in the two departments will continue, and the students will be assigned to their same academic advisors. Therefore, the merger will be transparent to the students in terms of requirements for graduation.

However, there will be a number of benefits to both the ME and AE students as a result of the merger. An effort will be made to teach the majority of both the ME and AE classes in Scott Lab which is a world class facility. Similarly, all of the students will have access to the ME computer labs which are also state of the art. Also, the student will have more opportunity for double majors and a wider selection of courses. On the graduate level, there will be a smaller possibility that courses will be canceled because of low enrollments or because of the inability to staff speciality courses. There will be an increased opportunity for ME and AE students to mingle informally, and this will provide a richer academic environment than currently exists. The students from both programs will also be exposed to a wider choice of employment options because they are likely to be more aware of the opportunities in each others disciplines. And finally, selected courses in both programs are likely to be improved because the co-located faculty will be sharing ideas with each other.

Undergraduate and graduate students from both departments were invited to attend an information session on May 14, 2009, to discuss the merger. Four members (I. Adamovich, J. Brighton, J. Haritonidis, G. Kinzel) of the merger committee attended also. Approximately 40 students attended the meeting. The students had a number of concerns, and an effort was made to convince them that their concerns relative to the merger would be address as we work out the details of the merger. The students requested that a special joint committee of students be formed to identify more fully issues affecting students that might arise during the merger. This committee has been established, and plans are to make this a permanent committee in the merged department. The membership of the committee consists of three undergraduate students and one graduate student from each department. The faculty merger committee will work with the

student committee to address student issues as they arise. However, it is to be noted that through the efforts of the merger committee and the student committee, the concerns of the students seem to have been addressed. A second student forum was held on May 27, 2009. Even though the second meeting was better advertised than the first, only about 6 students who were not on the student committee attended.

Staff Issues

Aerospace Engineering has one and a quarter administrative staff members, two advising staff members, and one technical staff member. Mechanical Engineering has eight administrative staff members, four advising staff members, and nine technical staff members. After the merger, the staff from AE will be combined with those from ME. Because both departments are currently understaffed, it is anticipated that no reduction in staff will result as part of the merger. Physically, the administrative staff from AE will be provided offices in N350 of Scott Lab. The advising staff from AE will be moved to offices in N250 of Scott Lab.

Currently, the computing support for the Aerospace program is provided by a full-time but temporary IT person. Following the approval of the merger, we anticipate that the computer operations for the two programs will run as separate operations during the first year. However, after that, the computer operations will be combined into a single structure managed from Scott Laboratory. Because all of the students in the combined programs will have access to all of the facilities, the operation will be more complex than what is now required for ME alone. Among other things, the combined computing staff will have responsibility for the facilities in Bolz Hall, at the Airport, and in Scott Lab rather than in Scott Lab alone. To enable the facilities in all three locations to be adequately served, it is anticipated that additional communications and security hardware and software will be required. We also anticipate that the position currently occupied by a temporary person in AE will be converted to a permanent staff position.

Space Issues

As a result of the merger, the AE faculty will be moved to Scott Laboratory, and some of the graduate students in Mechanical Engineering as well as lecturers and emeritus faculty members will be moved to Bolz Hall. When office assignments are made, the faculty with AE interests will be consolidated in the same area to the extent possible. Some renovations to Scott Lab will be required to facilitate the co-location of all of the faculty members in Scott Lab. Based on our review of mergers at other universities, a physical merger of the faculty is very important for a true integration of Mechanical Engineering and Aerospace Engineering and for the success of the merger.

Student services will also be combined as well as building services and computing. Ultimately, all staff members will have their offices in Scott Lab. These moves should lead to an improved efficiency in space utilization, and it should reduce to some extent the space pressures in both Mechanical Engineering and Aerospace Engineering.

The research space in Bolz, Scott, and the Gas Turbine Lab at the Airport will be assigned based on the needs of the faculty active in research. Initially, very few changes in space assignments are expected. As new faculty members are hired and as the needs of the current faculty change,

space will be reassigned as appropriate by matching the needs of the faculty to the available facilities. Beyond this, no attempt will be made to assign space in Bolz Hall exclusively to AE faculty or in Scott Lab exclusively to ME faculty.

Fiscal Issues

We do not expect any significant ongoing costs to occur as part of the merger. However, there will be some one-time costs resulting from the moves to Scott Laboratory and Bolz Hall, and for the necessary renovations. In particular, co-locating the combined faculty and staff will require some alteration of the spaces in Scott Lab and Bolz Hall. It is anticipated that the College will provide resources for the integration which is absolutely critical for the successful merger of the two departments. In addition, some renovation to the research space in Scott Lab will be required to accommodate AE activities, and some improvement in the computer infrastructure in the Gas Turbine Lab at the OSU airport will be required to make the system there compatible with that in Scott Lab. The one-time costs for all of the required renovations are not expected to exceed $295,000.

Also, it is critical for the combined department to have sufficient resources over the coming years to streamline its operation both in instruction and research areas by recruiting faculty in needed areas and to replace the retiring faculty. The College has agreed to assign future vacant faculty positions resulting from resignations or retirements to the merged department for a period of three years from the merger date, not including college wide reductions in faculty size
After the initial expenses associated with space renovations and the moves in general, the income and expenses associated with the merged department will be about the same as the sum for the separate departments. Therefore, the merger is expected to be revenue neutral.

While the merger will be revenue neutral in that the merged department will continue to receive the same resources and have about the same expenditures as the separate departments, the merged department will continue to be underfunded according to the university's budget model. The mechanical engineering department is under-budgeted based on the university's budget model, whereas the aerospace engineering department is over-budgeted. FY 09 budget figures are reported in Table 11 below for the two departments as well as the revenue sources and uses. Revenue sources include undergraduate and graduate student subsidies, tuition and fee income, indirect cost returns, and plant subsidy allocation. Uses include allocations for student services, research administration, and physical plant, and the central tax. Designated funds include distributions to departments for GRA and GTA fee authorizations, as well as distributions from IDC returns on industrially sponsored research, student technology fee income, summer enrollment income, and DDRS income. The target allocation refers to the budget position that would be indicated by the university's model. The data indicate that the merged department would continue to be under-budgeted but less so than the ME department is currently.

It is anticipated that, as the college moves toward re-aligning department base budgets to reflect the college's priorities as well as the university's budget model, additional resources would become available to the merged department as the college's fiscal position improves. Nevertheless, continuation of the under-budgeted position of the merged department under current conditions underscores the need for the merged department to be able to utilize resources that would become available with faculty/staff retirements and resignations if the anticipated benefits of the merger in terms of stronger mechanical and aerospace engineering programs are

to be realized in the long term. The MOU between the ME and AE departments and the college of engineering, attached in Appendix G, addresses this issue.

Table 11: Fiscal situation in the individual and merged departments

	ME	**AE**	**Merged Dept. (MAE)**
Present			
FY 09 Revenue sources	$ 17.9 M	$ 2.7 M	
FY 09 Uses	$ 9.1 M	$ 1.8 M	
FY 09 Designated funds	$ 1.46 M	$ 218 K	
FY 09 PBA plus designated funds	$ 8.6 M	$ 2.1 M	
Target Allocation	$ 10.6 M	$ 1.1 M	
Budget Position (+ over, – under) funding	– 18 %	+ 94 %	
After merger			
PBA plus designated funds – FY 09 levels			$ 10.7 M
Target Allocation			$ 11.7 M
Budget Position (+ over, – under) funding			– 7.8%

Impact on Diversity

Both departments have been sensitive to diversity issues and have aggressively recruited students of underrepresented groups. In addition, the College of Engineering has a policy that provides direct support for hiring faculty from underrepresented groups. Therefore, the merger is not likely to have any direct impact on diversity. If there is an impact, it will be positive because the merged department can recruit for both programs at individual events, and it may be possible to increase the number of events where we have a presence.

Impact on External Constituencies Including Alumni

After the merger, both Mechanical Engineering and Aerospace Engineering will maintain their separate undergraduate and graduate programs. They will also have separate external advisory committees. Therefore, the effect on all external constituencies is expected to be minimal.

Impact on Academic Freedom and Responsibility

The academic freedom and responsibilities of the Mechanical-Engineering and Aerospace-Engineering faculty will not be affected by the merger.

General Information on the Mechanical and Aerospace Engineering Programs

Tables 12-20 give summaries of the statistics for the Mechanical-Engineering, Nuclear-Engineering, and Aerospace-Engineering programs for the last four years. Summaries of the faculty members, their backgrounds, and interest areas for each program are given in Tables 21 and 22.

Summary

The committee charged with studying the effects of the merger of Mechanical Engineering and Aerospace Engineering believes that there is significant synergism for both ongoing and future research in ME and AE. The resulting department will be better positioned to achieve excellence than either ME or AE would be if they do not combine, given the College's projected future environment of flat or shrinking resources. Specifically, the merger should result in:

- Increased collaborative research activity between the faculty from ME and the faculty from AE,
- Improved national visibility of the resulting Department and College among peer institutions and technical societies, and improved visibility of the Aerospace Program in particular,
- Improvements in teaching efficiency,
- More efficient use of space,
- Better advising and service for undergraduate and graduate students,
- Faculty balance consistent with that in highly-ranked peer institutions,
- A merger that is revenue neutral after the one-time costs are paid.

Therefore, the Merger Committee is unanimous in its belief that the merger will benefit the combined department and the Engineering College as a whole, and it strongly recommends that the merger be approved.

Table 12: Autumn Quarter Graduate Program Enrollment in Both Programs

	2006	**2007**	**2008**	**2009**
ME	265	251	263	270
AE	33	34	35	45

Table 13: Degrees Granted in Each Program by Academic Year

Program	Degree	**2005-06**	**2006-07**	**2007-08**	**2008-09**
ME	MS	61	49	62	60
ME	Ph.D.	14	12	22	29
AE	MS	8	3	13	12*
AE	PhD	0	4	1	3*
	TOTAL	**83**	**69**	**99**	**104**

Table 14: Undergraduate Course Enrollment (14th-Day) in Mechanical Engineering

Course	**2005-06**	**2006-07**	**2007-08**	**2008-09**
ME250	201	206	215	246
ME410	683	696	760	836
ME420	427	497	516	557
ME430	437	469	695	604
ME481	175	187	224	240
ME482	134	180	191	221
ME500	105	130	118	115
ME501	221	243	255	293
ME502	180	181	193	206
ME503	172	182	218	230
ME504	155	183	208	223
ME510	176	209	211	221
ME553	188	183	178	181
ME561	177	196	197	247
ME562	197	177	176	188
ME563	179	180	167	182
ME564	111	162	170	145
ME565	56	30	0	100
ME570	163	170	182	123
ME571	140	192	169	201
ME581	126	142	303	267

Table 15: Undergraduate Elective Course Enrollment (14th-Day) in Mechanical Engineering

Course	2005-06	2006-07	2007-08	2008-09
ME/NE505	76	91	67	86
MEH610	0	9	8	18
ME612	0	0	0	0
ME621	0	31	25	0
ME622	0	28	33	35
ME627	23	26	16	22
ME628				
ME630	39	32	22	50
ME631				
ME634	0	0	0	0
ME639	28	55	63	135
ME641	24	8	11	21
ME650	16	22	29	26
ME654	40	41	42	30
ME662	24	28	25	6
ME666	0	0	0	20
ME672	9	23	9	18
ME674	15	30	31	32
MEH680	9	21	23	0
ME682	122	148	205	105
ME683	15	42	11	30
ME687	66	53	53	24

Table 16: ME7XX Graduate Course Enrollment (14th-Day) in Mechanical Engineering

Course	2005-06	2006-07	2007-08	2008-09
ME701	14	31	39	46
ME702	10	8	17	6
ME705	13	13	22	30
ME/NE707		13	17	14
ME710	16	13	26	32
ME712				
ME715	10	2	0	13
ME726	12	22	10	17
ME727	78	31	26	9
ME730	9	0	8	0
ME731	27	32	28	7
ME733	0	17	0	31
ME735	6	20	14	0
ME736	10	10	33	28
ME737	0	7	10	11
ME738				
ME740	20	11	11	39
ME743	25	18	31	41
ME744	25	31	20	39
ME751	15	23	29	34
ME752	21	8	9	0
ME753				
ME754	21	33	23	16
ME760	16	19	17	12
ME761	18	20	13	24
ME762	0	2	0	0
ME763	23	12	10	30
ME764	0	0	0	Not offered
ME765	14	22	15	18
ME766	21	13	24	0
ME767	0	0	0	0
ME768				
ME770	15	11	16	9
ME771	7	14	9	6
ME773	7	12	9	9
ME774	0	12	14	22
ME776.01	8	7	9	Not offered
ME776.02				
ME776.03				
ME777	9	Not offered	12	Not offered
ME778	Not offered	5	Not offered	4
ME779	Not offered	3	Not offered	0
ME780	14	13	15	54
ME781	Not offered	20	Not offered	9
MEH783	32	60	51	47
ME784	28	Not offered	17	Not offered
ME785	Not offered	20	0	12
ME787	Not offered	Not offered	0	18

Table 17: ME8XX Graduate Course Enrollment (14th-Day) in Mechanical Engineering

Course	2005-06	2006-07	2007-08	2008-09
ME803	0	4	6	0
ME804	0	4	0	6
ME805	0	0	0	7
ME806				
ME807	0	0	0	0
ME808	7	0	0	0
ME809	0	7	0	0
ME810	7	0	0	0
ME811	15	0	6	0
ME813	0	12	0	16
ME814	0	6	0	11
ME818	0	0	0	0
ME820	8	0	7	0
ME826				
ME832	0	13	0	0
ME833	9	0	8	0
ME834	0	0	10	0
ME835				
ME837	0	12	0	8
ME839	0	0	0	0
ME840	0	9	0	13
ME843	0	7	0	7
ME844				
ME847	11	0	10	0
ME851	0	0	8	0
ME859	23	0	22	0
ME864				
ME870	14	0	11	0
ME873	0	0	0	5
ME874	0	9	0	9
ME890	9	6	8	0

Table 18: Course Enrollment (14th-Day) in Nuclear Engineering

Class	2005-06	2006-07	2007-08	2008-09
NE505	76	91	67	86
NE606	20	32	25	29
NE610				5
NE701				13
NE704			4	
NE705				8
NE707	13	17	14	18
NE708	23	28		
NE710				
NE716	16	13		13
NE720	8	12	6	
NE735	18	12	12	10
NE736	10	31	13	19
NE737		7	10	10
NE738				
NE742	16	11	14	6
NE743	10		16	
NE744	12	6	11	6
NE745	8	7	3	
NE766	13	9		
NE771				
NE776	7	9		
NE845				
NE865	7	7	6	
NE880.02				
NE880.03				
NE880.04				
NE880.05				
NE880.08				

Table 19: Undergraduate Course Enrollment (14th-Day) in Aerospace Engineering

Course	**2005-06**	**2006-07**	**2007-08**	**2008-09**
AE 200	81	76	94	91
AE 201	59	67	82	66
AE 405	55	59	71	57
AE 414	50	56	51	61
AE 510-01	45	39	47	42
AE 510-02	46	36	48	44
AE 510-03	46	36	46	44
AE 512	45	45	53	56
AE 513	38	47	48	56
AE 514	41	40	50	51
AE 515-01	37	31	36	36
AE 515-02	7	5	10	6
AE 516-01	37	31	36	38
AE 516-02	6	8	8	7
AE 517-01	37	31	35	39
AE 517-02	6	6	9	6
AE 520	45	45	51	60
AE 521	49	41	43	55
AE 530	49	49	51	56
AE 542	46	45	45	57
AE 543	46	46	46	54
AE 550	45	55	51	53
AE 560	47	48	49	51
AE 561	9	7	12	
AE 570	43	46	50	50
AE 580				62
AE 581	46	49	16	

Table 20: Elective and Graduate Course Enrollment (14th-Day) in Aerospace Engineering

Course	**2005-06**	**2006-07**	**2007-08**	**2008-09**
AE 612	16	17	20	24
AE 615	10	10	29	29
AE 616	4	cancelled	1	6
AE 620				
AE 621	10	19	11	cancelled
AE 626	19	15	11	5
AE645				
AE661				
AE720	11	7	7	cancelled
AE745				23
AE751	41	36	29	29
AE752	24	18	27	20
AE760				
AE771	5	9	5	
AE775			12	17
AE800	8	20	4	15
AE801	2	8	cancelled	4
AE802	3	3	cancelled	
AE803		1		
AE805			7	
AE810				
AE820			3	
AE842				7
AE844			5	
AE850				
AE851	15	10	17	16
AE860	1			15
AE865	4			
AE866				
AE868		9		
AE873		12	8	7
AE875				5

Table 21: Mechanical Engineering Faculty

Name	Year of Ph.D. Degree; University	Research Interests
Adamovich, Igor	1993, Ohio State Univ. (Chemical Phy.)	High speed flow, plasmas
Aldemir, Tunc	1978, University of Illinois (NE)	Reliability and risk assessment
Altan, Taylan	1966, University of California, Berkeley	Net shape manufacturing, machining
Bechtel, Stephen E.	1983; University of California-Berkeley	Nonlinear mechanics, viscoelasticity
Bhushan, Bharat	1976, University of Colorado	Nanotribology, mech. characterizing
Blue, Tom	1978, University of Michigan (NE)	Reactor instrumentation, radiation effects
Busby, Henry	1971, Univ. of Southern California (AM)	Inverse problems, mechanics
Conlisk, Terry	1978, Purdue University	Micro/nanofluidics, electrokinetics
Dapino, Marcelo	1999, Iowa State University	Smart materials, system dynamics
Dunn, Mike	1961, Purdue	Aerodynamics, heat transfer
Dupaix, Rebecca	2003, Massachusetts Inst. of Tech.	Mechanics of composites and soft tissue
Ghosh, Somnath	1988; Univ. of Michigan (ME&AM)	Computational mechanics, multiphysics, multi-scale problems
Gilat, Amos	1982; Brown University (AM)	Experimental mechanics, plasticity
Guenther, Dennis	1974, Ohio State University	Vehicle dynamics, design, education
Guezennec, Yann	1985, Illinois Institute of Technology	Automotive, IC engines, energy systems
Harper, Brian D.	1983; Texas A&M	Composite materials, viscoelasticity
Heremans, Joseph	1978, Catholic Univ. Louvain, Belgium	Thermal Transport in nanostructors.
Kahraman, Ahmet	1990, Ohio State University	Gearing and tribology
Katsube, Noriko	1982; University of California-Berkeley	Comp. materials, continuum mechanics
Kinzel, Gary	1973, Purdue University	Kinematics, design, CAD/CAM, Mfg.
Lee, J.K.	1976; University of Texas-Austin	Computational mechanics, Mfg.
Lempert, Walter	1981, University of Utah (Chemistry)	Laser based diagnostic, plasmas
Lilly, Blaine	1998, Ohio State University (ISE)	Precision molding, plastics, education
Luscher, Anthony	1995, RPI	Design, snap fits, plastics
Mazumder, Sandip	1997, Penn State	CFD, combustion, reacting flows
Mendelsohn, Daniel A.	1979; Northwestern University	Fracture and contact mechanics
Menq, Chia-Hsiang	1985, Carnegie Mellon University	Precision measurements and engineering
Moran, Michael	1967, University of Wisconsin	Thermal systems design, education
Parker, Robert	1995, University of California, Berkeley	Dynamics, vibrations, and stability
Rizzoni, Giorgio	1986, University of Michigan	Automotive propulsion, dyn. systems
Samimy, Mohammad	1984, University of Illinois	Aeroacoustics, compressible turbulence, fluid dynamics
Selamet, Ahmet	1989, University of Michigan	IC engines, wave dynamics.
Singh, Raj	1975, Purdue University	Acoustics and vibrations
Siston, Robert	2005, Stanford University	Biomechanics, machine design
Smidts, Carol	1991, Universite Libre de Bruxelles	Risk assessment
Srinivasan, Cheena	1976, Purdue	Dynamic systems, controls
Staab, George, H.	1978; Purdue University (AE)	Experimental mechanics, education
Subramaniam, Vish	1979, Columbia	Non-equilibrium thermodynamics
Sun, Xiaodong	2001, Purdue University (NE)	Thermal hydraulics and reactor safety
Sutton, Jeffrey	2005, University of Michigan	Turbulent flows, combustion
Utkin, Vladim	1971, Inst. of Control Sciences, Moscow	Sliding mode control
Walter, Mark E.	1996; California Institute of Tech. (AM)	Mechanics of materials, thermomechanics
Wang, Junmin	2007, University of Texas, Austin	Controls, Automotive Systems
Washington, Gregory	1994, North Carolina State University	Mechatronics, smart materials, dynamics
Yu, John (Sheng-Tao)	1989, Penn State	Num. analysis, high performance compt.
Lisa Abrams (Clinical)	2001, Ohio State University (ISE)	CAD/CAM, design,
Haldeman, Charles (Research)	2003, Ohio State University (AE)	Aerodynamics, heat transfer

Table 22: Aerospace Engineering Faculty

Name	Year of Ph.D. Degree; University	Research Interests
Benzakein, Meyer	1967, Wayne State University	Airbreathing Propulsion
Bons, Jeffrey	1997, Massachusetts Institute of Technology	Experimental Fluid Mechanics and Heat Transfer
Chen, Jenping	1991, Mississippi State University	Computational Fluid Dynamics, turbomachinery, aerodynamics
Gregory, James	2005, Purdue University	Experimental Aerodynamics
Haritonidis, Joseph	1978, University of Southern California	Experimental Fluid Mechanics
McNamara, Jack	2005, University of Michigan	Aeroelasticity and Structural Dynamics
Oz, Hayrani	1979, Virginia Polytechnic Institute & State University	Flight Structural Dynamics, Aeroelasticity, Flight Automatic Control, Astronautics, Space Vehicle Design, Space Systems Engineering
Shen, Herman	1989, University of Michigan	Structures
Yedavalli, Rama	1981, Purdue University	Dynamics and Control Systems
Zhuang, Mei	1990, California Institute of Technology	Aeroacoustics and Fluid Dynamics
Ameri, Ali A	1990, Cleveland State University	CFD, Turbines, Aerodynamics and Heat Transfer
Freuler, Rick (Clinical)	1991, The Ohio State University	Applied and Experimental Aerodynamics, Jet Engine Test Facilities
Janiszewska, Jolanta	2004, The Ohio State University	Experimental Aerodynamics
Penko, Paul F.	1989, University of Toledo	Rocket Propulsion, Combustion and Emissions in Turbine Engines

APPENDIX A

Recommendations of Performance Planning Acceleration Task Force

Report of the College of Engineering Performance Plan Acceleration Task Force

DRAFT

28 January 2009

respectfully submitted on behalf of the COE PPAT Committee,

Steven A. Ringel
COE Performance Plan Acceleration Task Force Chair
Committee Members:
Jeffrey Bons, AE
John Brighton, EAD
Rudy Buchheit, MSE
L.S.Fan, CBE
Derek Hansford, BME
Walter Lempert, MEC
Bill Marras, IWSE
Randy Moses, EAD
Ann Pendleton-Julian, KSA
Steven A. Ringel, ECE – PPAT Chair
Ness Shroff, CSE & ECE
Linda Weavers, CEEGS

Report of the College of Engineering Performance Plan Acceleration Task Force

1. General Premise and Summary

The College of Engineering Performance Plan Acceleration Task Force (PPAT) was formed with a goal to make bold recommendations that will accelerate the implementation of the College of Engineering Performance Plan. Included and highlighted within this goal are specific charges required of the PPAT to develop and recommend innovative solutions that address specific issues raised in the Doctoral Program Review and in doing so, assist the College in reaching its Performance Plan goals with fiscal soundness and vitality. Hence, all deliberations were conducted within an inclusive context of promoting a modified college structure (both real and ideological) that the PPAT suggests is necessary for Engineering to expeditiously reach the stated goals of the Performance Plan. Thus, overarching issues that influenced the deliberations were the College's overall quality and impact, its ability to function at the highest level in the current challenging economic climate, its ability to be nimble and maximize its relevancy with respect to global and interdisciplinary research trends, and its ability to attract the best and brightest students and faculty. The goal is to provide the Dean's Office with a coherent and inclusive set of

specific department/program level recommendations that address issues raised in the Doctoral Program Review and build toward an evolved college structure that will enable the Performance Plan to succeed in an accelerated timeframe. Since the focus of the PPAT revolved around the Engineering graduate program and research, the ramifications of these recommendations on undergraduate and other aspects of Engineering, were not addressed in any substantive fashion, but would have to be considered during the implementation of these recommendations..

2. Background

The College of Engineering Performance Plan Acceleration Task Force (PPAT) was convened in mid-November 2008 at the request of the Interim Dean of Engineering, with the explicit task to make recommendations leading to accelerated implementation and impact of the College of Engineering Performance Plan, with primary focus on the College Graduate and Research programs. The PPAT consists of the following COE Faculty Members:

Jeffrey Bons, AE
John Brighton, EAD
Rudy Buchheit, MSE
L.S.Fan, CBE
Derek Hansford, BME
Walter Lempert, MEC
Bill Marras, IWSE
Randy Moses, EAD
Ann Pendleton-Julian, KSA
Steven A. Ringel, ECE – PPAT Chair
Ness Shroff, CSE & ECE
Linda Weavers, CEEGS

The PPAT was provided with a set of specific charges derived from the Graduate School Assessment of the College doctoral programs and the College's internal assessment of the same. The PPAT was required by the Dean's office to make recommendations based on these charges. The specific issues to be deliberated and discussed were: (1) the future of Aeronautical and Astronautical Engineering, City and Regional Planning, Civil Engineering, Industrial and Systems Engineering, Geodetic Sciences and

Surveying, Welding Engineering, Aviation and Nuclear Engineering, each of which scored deficiencies noted by the Graduate School Assessment of the Doctoral Program; (2) recommendations on the administrative location of the Knowlton School of Architecture, i.e. to remain within Engineering or be a stand-alone entity or be part of another college; and (3) potential strategic arrangements between key departments within the College. The PPAT was also tasked with the more general charge of making recommendations which, through their implementation will allow the entire College to achieve the goals of the Performance Plan and beyond.

3. PPAT Timeline and Process

Due to the complex nature of the tasks, the significant impact of the recommendations on the programs and departments of the College, and in order to understand and take into account sensitivities and historical issues within departments and programs that otherwise could not be appreciated by the PPAT group to the level needed in order to generate an informed set of recommendations, the following careful process was implemented in the short timeframe provided to the committee:

1. The PPAT member(s) from each department or program in question and others of interest to the PPAT were requested to prepare a 1-2 page summary of the local situation within each department/program, to be distributed to the entire PPAT for review and comment. These were: Welding Engineering (WE), Industrial Systems Engineering (ISE), Aeronautical and

Astronautical Engineering (AAE), Aviation, Nuclear Engineering (NucE), Biomedical Engineering (BME), City and Regional Planning (CRP) and the Knowlton School of Architecture (KSA), Civil Engineering (CVL), and Geodetic Sciences and Surveying (GSS).

2. To provide context and additional background, a set of recent documents generated either internally or externally, including the College of Engineering Performance Plan of 2008, the College's Internal Assessment of its Doctoral Programs, the Graduate School Doctoral Program assessment, statistical tabulations of various rankings and performance metrics of the College and its departments and programs (e.g. PhD students graduated and advised, publication records, funding, faculty profiles, etc) were distributed and discussed at the outset. The purpose here was twofold: (1) to ensure the PPAT could make recommendations within the appropriate context of quality given the diversity of the fields being discussed and thus could justify its recommendations with objectivity and (2) to gain a more external view of how the College performance stacks against peer institutions and so that the PPAT recommendations could impact the College as an external force, and avoid this from being just another internal retooling exercise. The sets of information within these documents were discussed in detail, giving the PPAT a common ground on which it could begin its deliberations.

3. Each individual who contributed a written summary was asked to present the situation to the entire PPAT for open discussion. The intent was to introduce a certain level of understanding and appreciate per department/program for the entire PPAT and also to provide an opportunity to note errors or inconsistencies in the Doctoral review early in the process so that the PPAT could deliberate from a sound base.

4. The PPAT discussed and deliberated each program listed in (1) above in great detail, resulting in various levels of recommendations to address the issues raised by the Doctoral review and also resulting in requests for clarifications as appropriate, since in more than one case inaccuracies in the Doctoral review were identified.

5. Once each department/program was discussed, the PPAT decided it was imperative to explore the much larger issue of COE as a single entity, noting that the programs called out in the Doctoral Program Review constituted a minority of the aggregate COE faculty and students. Significant discussions ensued regarding the structure and strategies of COE so that the goals of the Performance Plan could be met, with an objective that the set of recommendations be integral within a college-wide context, inclusive of all programs, highlighting the need to advance the quality and productivity of faculty and graduate programs in every department and program regardless of how they graded out in the Doctoral Program assessment. In other words, all recommendations are made with the goal to have each and every faculty member find a College structure than unlocks their potential to maximize quality and productivity.

Implementation of this process began in mid November 2008, immediately after the PPAT was formed by the COE Interim Dean. Due to the challenge of achieving the stated goals in a timely fashion given this short time period in which the PPAT could deliberate, the PPAT agreed to meet weekly for meetings often lasting up to 4-5 hours per session. The dedication of the PPAT members was remarkable.

4. Findings and Recommendations

Summary of Recommendations *(details in next section)*

1. Aeronautical and Astronautical Engineering (AAE) be realigned by merger with Mechanical Engineering (ME), leading to the creation of the Department of Mechanical and Aerospace Engineering.
2. Aviation be realigned within the recently formed EEIC (Engineering Education Innovation Center) as a cross-disciplinary undergraduate degree program within the College of Engineering.

3. City and Regional Planning (CRP) be re-aligned with the Knowlton School of Architecture's (KSA) core by strategic use of retirements, hires and curricular development. This will put KSA in a better position to determine its optimum administrative location within OSU.

4. Civil and Environmental Engineering and Geodetic Science (CEEGS) be restructured and realigned, with strategic reinvestment for its component programs.: Eliminate GSS graduate program, incorporate CoE GSS faculty into a restructured CVL graduate program, reinvestment in growth areas - energy, environment, green infrastructure, and geoinformation, create mechanism to exclude FTEs associated with EEIC from evaluative metrics for CEEGS.
5. Industrial, Welding and Systems Engineering (IWSE) be restructured to support the transition and department
6. Welding Engineering (WE) program be divested from Industrial Systems and Welding Engineering and realigned by merging with Materials Science and Engineering (MSE) following Faculty Rule 3335-3-37, *Alteration or Abolition of Units.*
7. Nuclear Engineering be modestly reinvested through targeted hiring, coupled with closer realignment with the Department of Mechanical Engineering and the College's energy initiatives.
8. Biomedical Engineering be reinvested through the hiring of senior faculty, finding a home for the department and undergraduate program on main campus, and the formation of a college-wide task force to develop strategies to further strengthen the BME program.
9. Both Electrical and Computer Engineering and Computer Science and Engineering departments seriously and immediately explore mutually beneficial scenarios leading to realignment, reinvestment, and possible merger of the departments.

If all recommendations are followed to the maximum possible extent, this plan will optimize and strengthen the College by reducing the number of departments/schools from 12 to 9 (merge AAE/ME, move Aviation into EEIC, merge ECE/CSE), eliminating 1 PhD program (GSS), restructuring 2 programs (CRP and CVL), realigning 1 program (WE), and targeting reinvestment in several specific areas.

Context

Prior to making recommendations on specific programs and departments as just outlined, the PPAT had deliberated extensively on the question of what p***o***tential barriers may exist in the College that could hinder achieving the levels of excellence sought by the Performance Plan. These discussions generated a context within which, a coherent set of specific recommendations could be made that are in full alignment with the goals and needs of the College. The result of these discussions is a recommendation on the structure of the college as a whole.

The PPAT recognized that a primary issue in the College that may present itself as a significant barrier against COE reaching its performance plan goals may be the traditional structure of the College itself, which has followed a path of evolution based on historical strengths in the classical fields of engineering and the undergraduate pedagogy of these distinct fields. Certainly this surprises no one since the classical fields of Engineering at OSU are indeed strong and undergraduate teaching is a central mission of the COE. However, the classic rigidity of this structure tends to make adaptability to emergent fields difficult, especially when those fields are between the classical engineering disciplines rather than within one of those cores. This is a natural evolution of engineering as an entire community and is fully based on successes for the past 100 years of engineering. In our College, the result of that is the presence of departments that at times may include oddly appended programs, others that could be better tethered to the college core, and gaps between the traditional cores. The PPAT strongly felt that this issue must be explored, addressed, and commented on prior to determining just how the various departments and programs singled out in the Graduate School report should be evaluated. In some cases the reasons for deficiencies might well be the structure of the College, and we wanted to be sure we understood all angles to the questions that have been raised.

Figure 1 shows a simple schematic of what the PPAT suggests the COE should strive to look like for it to be a consensus top 10 college from both an ideological and practical perspective. This "tee" structure is

based first on sustained strengths within the core disciplines and departments that are the pillars of Engineering, and second based on a parallel level of sustaining and expanding backbone that binds the core disciplines via key thrust areas, shared research infrastructure, new initiatives, centers, institutes, unique programs, etc. such that every core can participate as desired or needed across a variety of fields.

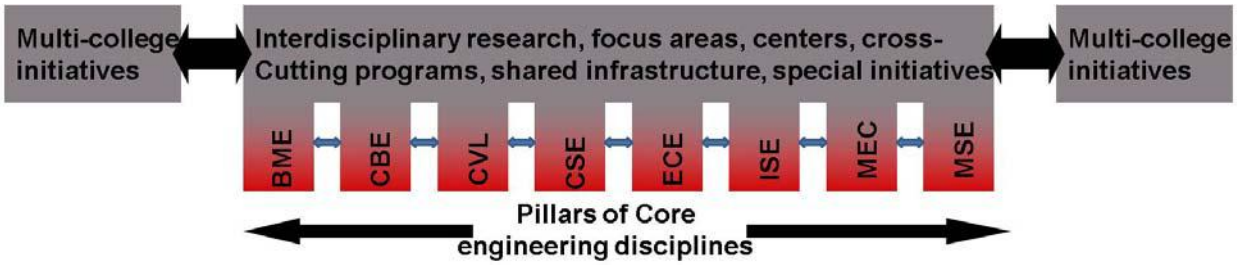

Figure 1. Suggested schematic for a College structure that can respond to global opportunities in a nimble, costeffective fashion. The "connective tissue" across the top of the "TEE" enables low barriers to collaboration, fiscal efficiency and a strong support structure for all in the College.

In this model, the core disciplines would be the strongest, most sustainable departments and programs, i.e. pillars of the College from a discipline standpoint. In the context of the PhD program assessment by the Graduate School, these would be those departments and programs grading very highly in that study. The backbone across the top of the TEE enables maximum leveraging of major research facilities and infrastructure (as well as administration), and this should be a primary goal since this enables true interdisciplinary collaboration from multi-discipline sources as well as enabling fiscal efficiency with reduced redundancy.

A basic tenet of this recommendation is that proliferation of departments and programs at the level of a core discipline without regard to how this fits into *a priori*-defined, unified college-wide goals must no longer be allowed. Figure 1 shows, and what we endeavor to explain, is that the backbone is, in fact a "*connective tissue*" between, surrounding and even permeating (and amplifying) the core traditional strengths of Engineering at OSU and that there be a structure and process to allow both the core and connective tissue to enter into symbiotic relationships, all safely couched within the College's superstructure. To move into this structure requires re-organization and re-aligning of specific groups, programs and departments. When major, interdisciplinary opportunities present themselves, the college itself should be able to easily mobilize groups to add to the connective tissue, as it is often the case that most major new agendas are too complex, have too short a time fuse and require unusual infrastructure such that most individual departments cannot respond effectively. To a large degree, the formation of TIEs, centers and institutes are designed to address this issue and become this connective tissue. Having faculty formally jointly appointed in some fashion to departments AND centers may assist connectivity. Further, this connective tissue must itself assist in forging an appropriate set of courses that faculty in joint appointments can teach and remove the traditional overhead inherent in cross-listed courses and discipline specific counting of course requirements for such faculty. Current barriers in conducting research and manning staff across the joint disciplines should also be eliminated.

There is another benefit that may be of even more importance for the College to achieve the level of excellence sought by the Performance Plan. Our analysis suggests that COE may be in danger of losing its ability to attract and retain the best and brightest students (not to mention faculty). This might be because those individuals generally desire to apply their skills and knowledge to truly multi/interdisciplinary problems. Thus it is important that the college structure be obviously attractive to these individuals. The PPAT is not in a position to advise the College as to how to implement this structure. But, the PPAT strongly encourages a structure that tends to generally match the research agenda nationally and internationally since it is the activity of research that attracts top faculty, attracts top graduate students, enhances reputation, and ultimately defines the (r)evolution of engineering and its many disciplines down to the undergraduate level, and this is because the global issues (not the discipline

issues) attract the imagination of bright K-12 students and potential donors alike. So it is within this context of transitioning from less than optimally connected boxes of departments and programs with solid boundaries, to pillars of disciplines with intimate interconnections that we make the specific recommendations on a department and program basis. We urge the College of Engineering to seriously consider this strategy and act with haste so that this model can become reality.

Required Recommendations of Specific Department and Programs

This section focuses on those recommendations that were specifically required based on the Doctoral Program Review and the charge to the PPAT. Each program/department reviewed in this report is described in a somewhat consistent format. In some cases, recommendations were isolated to the PhD program itself, whereas several programs required somewhat broader considerations for which there exists the need for more elaboration beyond this report. The summary recommendation for each program is organized in the following format: (i) PPAT recommendation, (ii) brief summary of program background and doctoral assessment result, (iii) discussion of the 4 options available (reinvest, realign, restructure, disinvest) and their relevancy to the particular program.

(I) AERONAUTICAL AND ASTRONAUTICAL ENGINEERING (AAE)

Recommendation. The committee recommends that AAE be realigned by merger with Mechanical Engineering, leading to the creation of the Department of Mechanical and Aerospace Engineering.

Background. The Department of Aeronautical and Astronautical Engineering (AAE) was formed in 1948 and from around 1960 - 1990 was a consistent "top 10" Aerospace Engineering department nationally. AAE has been historically strategic to the college of Engineering and to OSU, due in part to its sustained excellence in multiple areas and also to its proximity to NASA Glenn, Wright Patterson AFB and to GE Aerospace, which together make OSU a naturally central location for high impact aerospace research and education. However, AAE entered an era of some uncertainty from 1994- 2003 during which it was merged with various smaller departments within COE, losing some of its historic presence. In 2003 a committee of internal and external members reassessed AAE and decided to revitalize and strengthen AAE. As a result, of the 10 faculty members in AAE, 6 have been hired in the past 5 years, not including 3 other faculty positions were moved from AAE to Mechanical Engineering before 2003. Additionally, AAE currently has active searches to fill 2 more positions that are endowed senior faculty positions. Hence, AAE has in essence been receiving reinvestment by the College since 2003.

In spite of this important positive progress, there remain issues noted by the Graduate School review that led to a conclusion that AAE must be reassessed or restructured in order for the College to bring its graduate program up to the levels of excellence it expects from its Performance Plan. Specifically these issues are the size of the faculty and the small graduate student population. While not disagreeing with that conclusion, The PPAT notes that the above mentioned reinvestment history might not have been known and considered in the Graduate School review and perhaps a grade of "Premature Assessment - Future Assessment Required" might have been more appropriate for the AAE situation.

Options and Process. Among the options for programs the committee was asked to consider (disinvest, reinvest, realign, restructure), the committee believes the best overall course for AAE is realignment through a merger with the department of Mechanical Engineering.

The committee noted that a thorough reassessment recently occurred (2003) and appropriate moves to reinvest were recommended at that time and taken, some of which are still in effect. However, the committee notes that even with these moves there is sufficient cause (low graduate student population, relatively small faculty size, lack of fiscal support to grow beyond current plan) for a restructuring of AAE in order to achieve the level of excellence commensurate with the College goals. It is viewed that AAE is a critically important component of the College of Engineering, due in part to the need for a strong AAE program in a state with a very strong aerospace presence. Since there is already strong

synergy and collaboration at the research level between AAE and ME, and faculty who are already joint between the departments, and there exists overlap of fundamental principles between the two departments, merging with Mechanical Engineering would help to stabilize AAE in its current growth trajectory, enhance its reputation, generate a healthier level of student interest and PhD production, and also expand the range of impact by Mechanical Engineering.

The committee also recommends preservation of both undergraduate and graduate degrees in AAE, administered within a renamed Department of Mechanical and Aerospace Engineering.

The committee recommends that serious discussions between the departments and EAD commence immediately. This realignment must take place through the university's unit merger process, which prescribes development of a merger proposal with appropriate periods of due diligence. This process should permit the development of a merger plan that best meets the needs of the faculty, staff, students and other constituencies involved.

(II) AVIATION

Recommendation. The committee recommends that Aviation be realigned within the recently formed EEIC (Engineering Education Innovation Center) as a cross-disciplinary, stand-alone undergraduate degree within the College of Engineering.

Background. The Aviation Department does not currently have a graduate program. It does have 3 undergraduate tracks: Aircraft Systems (Pilot Certification), Aviation Management, and Air Transportation Systems (new in 2008). There are currently two tenure track faculty members in Aviation and 4 instructors serving a large (~ 300) undergraduate population. The department proposed a new MS in Air Transportation Systems in 2007 to serve a need for trained professionals to design, create, and manage available air transportation systems. The degree was approved by COE in 2007 contingent on increasing the number of tenure track faculty in the department. However, no additional tenure-track faculty hires have been authorized for the department since that assessment and one tenure-track faculty left OSU in 2008. Though discussions have been ongoing regarding a possible merger of Aviation as a program within Aerospace Engineering to enable an Aviation MS program, this is not warranted in part due to the importance of the AAE-ME merger. The PPAT noted the considerable community interest in retaining the aviation program at OSU, as it has significant industrial support, namely with NetJets as a very interested party.

Since the Aviation Department does not currently have a graduate program, it was not included in the Graduate School review; however its presence with respect to AAE warrants PPAT consideration.

Options and Process. Among the options for programs the committee was asked to consider (disinvest, reinvest, realign, restructure), the committee determined the best overall course for Aviation is to be realigned by inclusion within the EEIC, and retain its independent status as an undergraduate-only degree program.

The committee noted that interested aviation faculty can pursue active research programs in Air Transportation Systems in conjunction with faculty and graduate students from the Integrated Systems Engineering department, a more compatible marriage than with Aerospace or Mechanical Engineering. Thus, the TIE for the 2 Aviation faculty members would be within either ISE or Mechanical/Aerospace Engineering. The committee also noted that a merger between Aviation and Aerospace may be counterproductive to the continued health of the Aerospace department and certainly would influence the recommended merger between Mechanical and Aerospace.

The committee recommends that current plans to merge Aviation with Aerospace be put on indefinite hold while discussions are enjoined between the Mechanical and Aerospace departments. At the same

time, the committee suggests that the College begin discussions leading to the integration of Aviation as a program within the EEIC umbrella.

(III) CITY AND REGIONAL PLANNING AND THE KNOWLTON SCHOOL OF ARCHITECTURE (CRP and the KSA)

Recommendation. The committee recommends that City and Regional Planning (CRP) be re-aligned with the Knowlton School of Architecture's (KSA) core by strategic use of retirements, new hires and curricular development. This will put KSA in a better position to ultimately determine its optimum administrative location within OSU at the appropriate time.

Background. The City and Regional Planning Program at Ohio State was first established in 1958 and has nine faculty (7.25 lines) and approximately 100 students. The program emphasizes preparing students to be able to perform on the job as beginning planners and, more importantly, to be able to adapt over a life-long career to the changing public agenda. To do this, the program emphasizes courses with intellectual rigor and a thoughtful approach to decision-making. Moreover, the program provides not only important academic material but also requires students to take at least one studio where they come into contact with real world clients and problems.

KSA's CRP program has several notable strengths. The program's emphasis on applying academic teaching to professional practice is especially evident in the Intern Program which is the largest in the country. The program also provides opportunities for numerous dual degree programs, including transportation, law, social work, landscape architecture, environmental science, public policy and management. The program is also home to the *Journal of Planning Literature*, one of the three major planning journals in the US. Its faculty is very actively engaged in research, with average research revenue per faculty member in 2003-2007 reaching $149,460 which is above the national average.

Despite these strengths, there are challenges that face the program. Its national ranking is good but could be better: according to the Planetizen program survey, of more than 90 departments of City and Regional Planning in the country, KSA's CRP program ranks: #15 according to Educators; #20 according to Practitioners; #13 for Faculty Scholarly Productivity (see www.academicanalytics.com); retirements and the current financial constraints on new hires put the program in a vulnerable situation for reaccreditation; and the future of the intern program is uncertain in the current fiscal situation (the City of Columbus withdrew its future funding; and as one of three sections, it is not well integrated into the core activity of the Knowlton School of Architecture which is a TIU with a total of 24 faculty and 500 graduate and undergraduate students.

Looking forward, there are opportunities for CRP. The OSU University Senate has approved a CRP undergraduate program which will begin once it passes through the Ohio Board of Regents. The KSA's Strategic Plan calls for an integrated first year undergraduate curriculum across all three disciplines (Arch, LArch and CRP). Of the nine faculty members, two will retire by summer 2009. Strategic Planning Discussions have led to discussions about CRP's future direction in the school specifically the manner in which it will recalibrate its focus to better integrate with the other design sections Considering the current status of CRP and the threats it faces, the Graduate School concluded in the 2008 Doctoral Program Assessment articulated the Graduate School's position that the CRP doctoral program must "reassess and/or restructure".

Options and Process. Among the options for programs the committee was asked to consider (disinvest, reinvest, realign, restructure), the committee believes the best overall course for CRP is realignment with the core of the KSA's teaching activities by careful realignment of focus through the use of retirements. At the appropriate time, this also enables KSA to move toward a unified position with respect to its optimum location, within Engineering, as a stand-alone entity, or within a different college.

The committee does not believe that disinvestment in the CRP doctoral program is warranted at the present time. The program has proven its value by strong placement of graduates in top planning programs in the country and in the public and private sectors. Re-assessment of the doctoral program should be conducted after new hires have been made and integrated into the school and program.

The committee does not believe that disinvesting in the CRP program overall is warranted or productive. This section is integral to the KSA mission and purpose which is about the inter-relationship of sociocultural practices with material practices through design and planning, at multiple scales (ideas to building components to buildings to cities to landscapes to territories). CRP represents the scale of systems and territories and therefore is a unique part of the mission of the school.

The committee does not believe restructuring CRP within another academic entity on campus is productive or useful for the section of for the KSA. The KSA needs to move forward with the full strength of its faculty and programs supporting the mission as articulated above.

Greater realignment of the CRP group with the core mission of the KSA is not without risk but it is essential for the KSA to achieve its core mission. The realignment should include investment in new faculty hires using vacancy credit from retiring CRP faculty, expansion of the urban design components of the section through careful selection during the hiring process, integration of undergraduate CRP coursework with Arch and LArch undergraduate coursework, and continued support on the part of the KSA of CRP's bridging relationships with other departments external to the KSA. Additionally every attempt shall be made to secure new funding sources for CRP's internship program.

The committee also recommends preservation of doctoral program in CRP at this point in time. The CRP program will strengthen with new hires and deliberate attention to its role within the entire school. The committee notes that this recommendation has been made with input and consensus from the CRP faculty that they wish to remain within the structure of the KSA.

(IV) CIVIL ENGINEERING AND GEODETIC SCIENCE AND SURVEYING

Recommendation. The committee recommends significant restructuring and realignment combined with strategic reinvestment. Noting that the committee viewed CVL and GSS as part of the same circumstance for its deliberations, the following set of recommendations were made:

- Eliminate the GSS graduate program and incorporate CoE GSS faculty into a restructured CVL program (graduate and undergraduate) that is aligned with current program strengths
- Through reinvestment and restructuring, refocus and integrate CEEGS on growth areas such as energy, environment, green infrastructure, and geoinformation.
- Balance ratio of PhD to MS-level students to favor PhD students. Award fellowships to PhD students. Eliminate barriers allowing for a direct route from BS to PhD for select students.
- Focus faculty efforts (e.g., eliminating weak tracks and programs, streamlining teaching)
- Create a mechanism to exclude FTEs associated with EEIC from evaluative metrics for CEEGS.

Background. Civil Engineering is an important component of the CoE, as it is critical to supporting our land grant mission. In fact, in the Grand Challenges for Engineering NRC report 3 of the 14 grand challenges fall primarily under civil engineering (manage the nitrogen cycle, provide access to clean water, restore and improve urban infrastructure). Additionally, geospatial information is a growing research area of national importance.

Civil Engineering (CVL) and Geodetic Science and Surveying (GSS) are housed in the Dept of Civil and Environmental Engineering and Geodetic Science (CEEGS). This department is a collection of merged departments: Engineering Graphics, Civil Engineering and Geodetic Science and Surveying. In 2008, faculty members originally from Engineering Graphics have been placed in the new Engineering

Education Innovation Center (EEIC) but their FTEs remain in CEEGS (none are research active, do not have Category P status in CVL or GSS, and do not report to CEEGS dept. chair). Additionally, five of nine faculty members from Geodetic Science have moved to Earth Sciences. The GSS program is now a cross-college program with four CoE faculty members and five MAPS faculty members. As of Fall 2007, the CVL program had 24 faculty members with Category P status, with 18 FTEs in CEEGS. A recent analysis of size of graduate programs indicates that the average size of top 10 Civil programs have 51 faculty. Although environmental engineering faculty (current size: 3.5) advise graduate students in civil engineering, there is a USNWR ranking for the Environmental/Environmental Health ranking (OSU rank: 39 of 95). This size is also small compared to an average size of 13 for top 10 programs. In fact, it is the highest ranked program for its size.

The PhD assessment report indicated that improvement is needed for CVL. Further, it stated that improvement must begin with a significant increase in the research and Ph.D. student productivity of its current faculty, and be further enhanced through the hiring of replacement faculty for positions vacated through retirements. The major concerns for the GSS program are the small number of faculty within the CoE, their high teaching load, and the non-standard nature of the program. Significant retirements in CVL and the beginning of replacement hires are already beginning to pay off. For example, last year's research expenditures per faculty in CEEGS were significantly improved over previous years.

Options and Process. Due to the complexity of the graduate programs of CVL and GSS, a simple recommendation of either disinvest, reinvest, realign, or restructure was not possible. Instead, a hybrid of realign, restructure, and reinvest emerged as the best option for the CVL and GSS programs. This recommendation strengthens the CVL program, facilitates integration of the department, and allows for strategic reinvestment in discipline growth areas. Additionally, in the US, GSS is typically found as a component within CVL programs.

The committee does not believe disinvestment in the programs is strategically sound. A thriving CVL program is critical to the COE and land grant mission of Ohio State. Additionally, the GSS faculty in COE though a small group, are visible, active and productive.

Maintaining the GSS and CVL programs "as-is" was not recommended because the size of CEEGS is small and relatively diffuse. The committee strongly feels that the many activities of CEEGS cannot be effectively maintained.

For GSS, a realignment option consisting of moving the BMPS part of GSS to BMPS and leaving the GSS part in COE as a self-standing program was discussed. . Although administrative savings may occur, if the 4 faculty in GSS in COE would keep the GSS program, they would have an even smaller program and higher teaching loads. Although the quality is high, the non-standard nature of GSS has less value as a stand-alone entity than as part of a standard discipline (e.g., CVL). Therefore, this option is not recommended.

It is apparent that CEEGS is a collection of groups. The committee strongly believes that GSS faculty need to become integrated into CVL. A name change, better incorporation of GSS faculty into CVL graduate and undergraduate teaching and a department seminar based on cross-cutting research topics are ideas that should be explored. Additionally, the committee felt that CEEGS should carefully consider how to best focus faculty efforts to allow more time for research endeavors. Therefore, realigning GSS with CVL and restructuring CVL focusing and integrating programs and groups in CEEGS is recommended.

Another restructuring need discussed is a legacy of a past merger with Engineering Graphics. A number of EEIC faculty members maintain their TIU in CEEGS but have no substantial interactions with the department. The additional faculty of the EEIC, especially in "per faculty" comparisons for CEEGS, skews information compared to other COE departments and Civil and Environmental programs nationally. Therefore, a mechanism is needed allowing FTEs associated with the EEIC to not be included in evaluative metrics for CEEGS.

Further, restructuring by eliminating small sub-groups in CVL is recommended. The many CVL tracks and teaching needs involved increases barriers for faculty interactions between groups, increases teaching loads, and reduces class sizes. A focused strategy to move forward based on thematic cross-cutting research areas would reduce barriers among groups. Incorporation of GSS into CVL would increase the number of faculty, graduate students, and research productivity in CVL possibly improving its ranking. Finally, for the health of the department and to allow the entire department as a focused group to rise in stature, consolidation is necessary. As they have demonstrated, they are now lean and with careful focus on growth areas a unique opportunity exists to reinvest, rebuilding CEEGS into a successful, well regarded program.

(V) INDUSTRIAL AND SYSTEMS ENGINEERING

Recommendation. The committee recommends to restructure IWSE to support the transition and refocus to Integrated Systems Engineering (ISE) by moving Welding Engineering outside the department

Background. The Industrial and Systems Engineering (ISE) program within the Industrial, Welding and Systems Engineering (IWSE) Department at OSU has a long and distinguished history within the profession. The program has enjoyed reasonably good national ranking in the late 80's and early 90's when it was ranked between 12th and 15th nationally. IWSE also has had a generally good research funding history (currently #4 in College) although it has struggled of late with the recent downturn in manufacturing and the faltering national economy. Since 2004 the program's U.S. News ranking has been between 12 (2004) and 19 (currently 18) out of 80 accredited programs in the U.S. (UIUC ranking - 23). Department strengths include the Human Factors/Ergonomics group (considered #1 in nation) and the Manufacturing group that was well funded until recent years. The department merged with Welding Engineering in 1994. The Welding Engineering program is a "one of a kind" program within the United States. While Welding Engineering enjoys a strong alumni base, partnerships with the Manufacturing group have not developed as was originally envisioned. As a result, Welding Engineering has not assimilated well into the department structure.

The department is in the process of changing its focus and image. In order to align itself with the evolving transformation in the manufacturing and service sectors of society the department has initiated a change from "Industrial, Welding, and Systems Engineering" to "Integrated Systems Engineering." This new name not only reflects the direction of modern enterprises but also reflects the department's strategic plan that emphasizes the interdisciplinary and multi-disciplinary approach to addressing societal enterprise issues.

The *Doctoral Program Assessment and Plan Report* (April, 2008) identified Industrial and Systems Engineering as a program that must reassess and/or restructure. The specific comments from the report narrative relative to the ISE program identify two points of concern:

- "City and Regional Planning, Geodetic Science and Surveying, and Industrial and Systems Engineering (is) are not standard disciplines elsewhere, except perhaps for the last. This makes them more difficult to assess form the outside and less valuable to a college seeking to reach the top tier nationally."
- "long times-to-degree ….. and a dismal portion of incoming students advancing to candidacy for Industrial and Systems Engineering."
-

The ISE program response to these two points consisted of the following points and actions:

- The "not standard discipline" comment was identified as a factual error. Supporting information for the mainstream nature of the field was provided.

- The "long times-to-degree" comment was considered a valid comment. The ISE program provided a 5-point plan to respond to the comment. The points included:

  - Restructure grad committee to emphasize program integrity
  - Review graduate faculty Ph.D. membership category
  - Explore reinstituting Ph.D. qualifying exam
  - Monitor "reasonable" progress among grad students
  - Streamline application and review process

All of these actions are now under way.

Options and Process. The options available to ISE consist of the following:

- Reinvest – While reinvestment generally helps programs, given the budget situation it is important that investments strengthen the emerging fields. Investments must be made strategically to strengthen not only the college pillars but also a college thrust area. In this manner, the college infrastructure can be enhanced. Therefore, to the extent the College is willing to enhance an emerging thrust area it makes sense to reinvest in a component of ISE.
- Disinvest - Given the need for ISE support to enterprises throughout the state of Ohio and the nation, this is not an option.
- Realign - Given the societal need and the interdisciplinary trends in engineering it is important that Integrated Systems Engineering remain one of the College "pillars" of engineering science.
- The recommended option is to restructure. Given the discontinuity of the Welding Engineering program within ISE it makes sense to restructure ISE so that the "pillar" is strengthened and move WE to a department (MSE, see below) that is a better fit with its focus.

(VI) WELDING ENGINEERING

Recommendation. The committee recommends for the Welding Engineering (WE) program *divestment* from Industrial Systems and Welding Engineering and *realignment* by merging with Materials Science and Engineering (MSE) following Faculty Rule 3335-3-37, *Alteration or Abolition of Units* and using approaches described in the document "*The Plan for the Future*", submitted by the Welding Engineering Faculty to the Transition Planning Committee, June 15, 2007.

Background. The WE program currently finds itself in a precarious state. Faculty research has declined, leading to a decline in the graduate and research programs and reduced visibility in the research community. Historically, institutional and department support for courses and laboratories has been low thus requiring more faculty time for the routine aspects of the instructional program. As measured by the University fiscal model, the Program is currently operating at a deficit. Recent retirements have reduced the WE faculty to six; a dangerously low level that threatens viability of the undergraduate and graduate educational offerings. Over the past 15 years, there has been a loss of program identity stemming in part from the IWSE merger. Recent changes in IWSE program direction do not appear to favor strengthening of WE, and there are attendant threats to student and faculty recruitment.

Despite its current situation, WE at OSU enjoys a national and international reputation for high quality research and education programs. Current overall graduate program enrollment is now 58 and undergraduate program enrollment is 96. WE is the only ABET accredited Bachelor of Science program of its type in the country, with its graduates highly sought and well regarded by industry and government. The Program has excellent research facilities and is capable of leading edge research in many areas of welding and materials joining. It shares a modern facility on West Campus with The Edison Welding Institute, which is one of the most highly regarded research and technology organizations in the world dedicated to the subject of materials joining.

Looking forward, there are notable opportunities for WE. The WE faculty estimates that there is $100m - $150m available annually is available through government and industrial sources. The college "Performance Plan 2008" has thrusts in advanced materials, bioengineering, energy, manufacturing, and power/propulsion where welding can play a major role. Closer collaboration with Edison Welding Institute can provide more opportunities for research funding, graduate/undergraduate research and joint use of equipment.

In addition to the circumstances surrounding the WE program, the committee notes the following comments from the Graduate School regarding the WE program in its 2008 Doctoral Program Assessment and Plan. The report states that "The doctoral program in Welding Engineering at present is not strong enough to be viable on its own and is categorized as a candidate for disinvestment or elimination", yet it also notes that "the program and college should explore strengthening connections with the Edison Welding Institute and industry as a means of gaining additional support", and that "a more appropriate name for the program would be "Materials Joining Science and Engineering." In view of the circumstances surrounding WE, the committee understands the divergence presented in these comments and believes it has formulated a recommendation that best addresses the complexity of the situation.

Options and Process. It is the opinion of the committee that prompt disinvestment in the PhD program would not support the goals of the College's Performance Plan, due to the positive comments made above and due to the potential of strategic linkages between the College and the Edison Welding Institute. Without a PhD program, it is extremely unlikely that high caliber faculty could be attracted to WE. Without excellent faculty, no academic programs are viable. Realignment of WE with MSE enables a continuation of materials joining research programs, opportunities for attracting materials joining faculty, solidification of the EWI-OSU linkage, and a cost-neutral continuation of the WE undergraduate program.

The committee does recommend realignment and the appropriate restructuring through a merger with MSE and is optimistic about the outcome. The realignment should include investment in new faculty hires using vacancy credit from retiring WE, expansion of research and integration with the MSE research programs, as well as increasing cooperation with the Edison Welding Institute at the department, college and university levels.

The disciplines of MSE and WE are both rooted in metallurgy and integration of welding and joining into perhaps the best metals program in the country is an intriguing and attractive prospect. In fact, WE students, both graduate and undergraduate take many MSE courses. Bringing WE into MSE would likely enhance the ability of WE to recruit high caliber faculty, which is the core of any rehabilitation effort. Alignment of curricula may enable efficiencies that would help to sustain the WE programs in view of the small size of the present faculty. Collaboration among faculty researchers would lead to growth in research programs.

WE realignment through a merger with MSE is not without risk. There is a possibility for negative impact on reputation for MSE and WE. MSE at OSU is viewed by some as a traditional program strongly attached to its metallurgy heritage and unwilling or unable to modernize as the field of materials science evolves. Incorporation of WE would validate that opinion for some. There are cultural differences between the two programs that are well documented. These would need to be managed as the programs integrate. The programs would be faced with merging during a period of fiscal regression, with an impending ABET accreditation visit in 2011, and on the cusp of a quarter-to-semester transition in 2012. The committee recommends that realignment take place through the university's "3-37" process. This process involves WE and MSE constituencies, and allows for self-determination within an appropriate framework subject to appropriate approvals. The committee also suggests that a revision of the WE Faculty's "*The Plan for the Future*" be undertaken and incorporated into the "3-37" proposal and used as the basis for setting the course, resource needs, duration of the probationary period and appropriate benchmarks for assessing the success for any WE program revitalization effort.

(VII) NUCLEAR ENGINEERING

Recommendation. The committee recommends modest reinvestment coupled with closer realignment with the Department of Mechanical Engineering and the College's energy initiatives.

Background. The Nuclear Engineering Ph.D. Program is located administratively within the Department of Mechanical Engineering, and is a small program with 15 Ph.D. students and four regular, full-time faculty members (3 Full Professors and 1 Assistant Professor). There are also five part time (adjunct or emeritus) faculty members associated with the program, as well as several part time lecturers. There are relatively few such programs in the country (ASEE counts 21, though the OSU program indicates that only 15 are "credible"). In 2006 the OSU program was ranked 14th out of these 15 programs. The student body is considered good, with an average quantitative GRE score of 731 and an average total GRE score 1244 (weighted three-year average). The faculty advise five Ph.D. students each, on average, and graduate 0.67 Ph.D students each per year, near the national average. The annual average research expenditures are $394,159 per faculty member. OSU is a member of a University Consortium with Battelle that operates the Idaho National Laboratory providing direct access to the principal reactor development research programs funded by the department of energy. OSU operates an Academic Center of Excellence in Instrumentation, Control and Safety within this consortium. OSU also has a research nuclear reactor on West Campus, which provides an excellent facility for a wide variety of research. The program has historically focused on the area of Instrumentation, Control and Safety, and has what is considered a national and world-class strength and reputation in this area.

The primary issue identified by the College of Engineering's PhD program review was that the small size of the NCL program makes it extremely difficult to realize the goal of advancing it to top ten status (out of 21 programs). The Task Force also noted that the Nuclear Engineering program, while formally part of the Department of Mechanical Engineering, was in fact rather insulated from the ME department as a whole, both in terms of graduate program structure and in inter-faculty research collaboration. Nonetheless it is the conclusion of the Task Force that given the important role that nuclear energy will clearly play in the overall energy policy of the U.S. in the near future it was important that Ohio State University maintain as strong as possible of a presence in the field, particularly as it is currently the only existing nuclear program in the state of Ohio.

Options and Process. Among the options for programs the committee was asked to consider (disinvest, reinvest, realign, restructure), the committee believes the best overall course for Nuclear Engineering is a combination of modest reinvestment coupled with realignment to produce tighter integration with the Department of Mechanical Engineering, in particular within the Thermal, Fluids, and Energy interest group. In particular it was determined that significant reinvestment resulting in a completely viable standalone program with 18-20 faculty was simply not realistically feasible. Elimination of the program was also not considered a viable option.

A two prong strategy is recommended. First, it is recommended that the College of Engineering find resources to hire two additional faculty members with vision and leadership potential whose primary research interests are in the area of Nuclear Engineering, and who would clearly extend the depth and strength of the program's research activities. New faculty members who would utilize and improve the research diversity of the reactor facility should be given priority in hiring. The TIU for these faculty members would likely, but not necessarily, be Mechanical Engineering. Second, it is considered essential to the success of the program that greater interaction be achieved between the Nuclear Program faculty and the faculty of the larger Department of Mechanical Engineering. Financial constraints dictate that the only way to significantly enhance the strength and presence of the program nationally will be to leverage its small size with the considerable synergistic interests and research activities of the Department of Mechanical Engineering.

Other Specific Program and Department Recommendations

The PPAT recognized that much of the recommendations required in its charge influenced mostly smaller departments and programs within the College. Since the goal for the PPAT is to accelerate the implementation of the Performance Plan, it was felt that where warranted, several other departments required discussion within the PPAT and received recommendations for their own advancement else the effects of the above recommendations would not have the college-wide impact as intended. Of the programs not targeted above (Materials Science and Engineering, Mechanical Engineering, Electrical and Computer Engineering, Chemical and Biomolecular Engineering, Biomedical Engineering and Computer Science and Engineering), three received PPAT attention: Electrical and Computer Engineering (ECE), Computer Science and Engineering (CSE) and Biomedical Engineering (BME). These are discussed below.

(VIII) BIOMEDICAL ENGINEERING

Recommendation. The committee recommends reinvestment in BME through the hiring of senior faculty, finding a home for the department and undergraduate program on main campus, and the formation of a college-wide task force to develop strategies to further strengthen the BME program.

Background. The OSU Biomedical Engineering Department was established as a research center in Electrical Engineering in 1971, giving recognition to this field as a separate academic discipline involving a unique integration of biology, medicine, and engineering sciences. Offering the M.S. and Ph.D. degrees, the Center became a free-standing entity in 1988 within the College of Engineering. In 1999, the BME Center expanded through a Selective Investment award in cardiovascular bioengineering. After a failed attempt to form a joint department with the College of Medicine, BME became a department within the College of Engineering in 2006. BME has just received approval of its undergraduate program in October 2008.

In the doctoral program assessment, BME was listed in the "New or Developing" category based on its new department status and new undergrad program. In the CoE internal assessment, the BME doctoral program was listed as "Adequate." BME as a discipline is highly interdisciplinary, and this is reflected in the department, as it has many faculty with split appointments, a large portion of graduate students have their research advisor (and funding) in the College of Medicine, and much of the funding results from collaboration with other departments across campus. BME currently has 15 faculty with at least 20% appointments in BME, with 1 Clinical Assistant Professor, 4 FTE Assistant Professors, 4.8 FTE Associate Professors (1 without tenure), and 1.2 FTE Full Professors (1 FTE is the department Chair). Since the hiring of Prof. Hart as chair, the department has focused on strategic planning, development of the undergraduate major and courses, alignment of the graduate program to correlate with the undergraduate program and faculty expertise, and increasing research funding, including the recruitment of fully funded senior faculty. One of the primary impediments to improving is the BME location, in Bevis Hall on West Campus. Many of the BME faculty have laboratory space spread around campus (in CoM ,CoE, VetMed, Nanotech West, Bevis Hall, Dentistry), and the students have to take the bus out to Bevis Hall to atten classes. The undergraduate major requires classroom space for lectures (~100 students), lab courses and experiences within our domain courses, and computer lab courses and homeworks.

The future of BME holds great promise. Since the undergraduate program has been announced, BME has become the most requested major within the college for interested high school students. The interest generated by the BME major should help increase enrollments in other engineering departments. Ongoing collaborations between BME faculty and the College of Medicine are advancing through focused summits to bring together medicine and engineering faculty.

(IX) ELECTRICAL & COMPUTER ENGINEERING/COMPUTER SCIENCE & ENGINEERING

Recommendation. The committee recommends that both departments seriously and immediately explore mutually beneficial scenarios leading to realignment, reinvestment, and possible merger of the departments.

Background. The OSU ECE and CSE departments are two of the three largest departments in the College of Engineering. Nationwide rankings of Colleges of Engineering are strongly correlated to the individual rankings of these departments.

Historically the ECE department at OSU has been ranked highly for more than 50 years, consistently ranging from rankings in the low teens to mid twenties and is currently at the 89+ percentile (26th). The ECE department has several prominent and internationally renowned faculty members, with 23 IEEE fellows and one NAE member. In spite of the quality of its program, the ability for ECE to sustain this ranking, much less improve its position, is being seriously eroded by factors such as its small total faculty size (42), which is far below average for peer ECE departments nationwide (typical departments may be 60-110 faculty members strong).

The CSE department has made enormous progress over recent years, working with relatively limited resources from the college of engineering. Its hiring has been exemplary, resulting in 20 NSF CAREER awardees from its department (roughly 1/3 of the total number of CAREER awardees in the university). The CSE ranking has steadily improved over the years and is currently ranked 31st in the country. CSE programs at other universities that have climbed in the rankings over the last two decades have had substantially greater increases in the size of their faculty.

More recently significant collaboration and interdisciplinary coordination and efforts between ECE and CSE have evolved, with shared efforts in communications, sensing, computer vision and also computer engineering, and jointly appointed faculty.

Options and Process: The committee feels that the time is ripe for both departments to undertake a serious dialogue with each other and with the college of engineering about the possibility of merging. A merger would shore up strengths in areas where each individual department is weak, result in greater visibility of the overall program, reduce certain teaching redundancies, and improve administrative efficiency. However, such a merger could lead the combined departments to reach higher levels of international acclaim and acknowledged excellence only with a reinvestment commitment from the college of engineering. Hence, it is critical to have a realistic and in-depth plan of how the college could enable such a merger to occur. Current successful models of EECS departments across the nation are substantially larger than a merged ECE-CSE department, and thus the college will need to make an investment to grow this merged department if it is to compete successfully at a top level. The committee also recognizes that there are significant cultural differences between the two departments, which may make such a merger challenging to achieve in practice. This is why the committee recommends that all pros and cons of this merger be carefully considered, benefiting from successful models of similarly merged top-ranked EECS programs.

APPENDIX B

Report from Merger Study Group

Report of the College of Engineering Performance Plan Acceleration Task Force Subcommittee on Merger of Aeronautical and Astronautical Engineering with Mechanical Engineering

March 18, 2009

Subcommittee Members:

John Brighton - College of Engineering
Ahmet Kahraman – Mechanical Engineering Department
Jack McNamara – Aeronautical and Astronautical Engineering Department
Mo Samimy - Mechanical Engineering Department
Joe Shaw - NASA Glenn Research Center
Jim Williams - Materials Science and Engineering Department 2

Background

In order to accelerate implementation of the College of Engineering strategic performance plan, a Performance Plan Acceleration Task Force (PPAT) was established in the autumn quarter of 2008. In the context of the college's fiscal situation, recommendations of the previous doctoral program assessment task force, and evolving University planning priorities, this task force (PPAT) in their final report of February 2009 made nine specific recommendations for accelerating implementation of the College of Engineering Performance Plan. Subcommittees were then formed to analyze each of the nine recommendations that involved recommendations of a merger, elimination or restructuring and to advise the Interim Dean and the college executive committee on future directions for the college.

The Interim Dean of the College of Engineering commissioned nine subcommittees including this Subcommittee to address the proposed merger of the Aeronautical and Astronautical Engineering Department with the Mechanical Engineering Department. This Subcommittee is comprised of:
John Brighton - College of Engineering

Ahmet Kahraman – Mechanical Engineering Department
Jack McNamara - Aerospace Engineering Department
Mo Samimy - Mechanical Engineering Department
Joe Shaw - NASA Glenn Research Center
James Williams - Materials Science and Engineering Department.

The Subcommittee was given the following charge (detailed subcommittee charge is given in Appendix I):

"The major task of this subcommittee is to analyze and investigate the recommendation of the PPAT committee that the Aeronautical and Astronautical Engineering department (AAE) be realigned by merger with the Mechanical Engineering department (ME), leading to the creation of the Department of Mechanical and Aerospace Engineering. While the committee **must** address the scenario above, it can also explore other scenarios: 1) The transfer of mechanical engineering faculty involved in aerospace engineering to the aerospace engineering department. 2) A well-defined and formal collaboration mechanism to enhance aerospace engineering, involving the aerospace and mechanical engineering departments. In any proposed scenario it is expected that the committee will list all advantages and disadvantages associated with any choice."
These options were to be explored under the constraint that additional resources from the College and University are severely limited.

The due date of March 18, 2009 was given to the Subcommittee to provide a written report of the assessment and findings of the Subcommittee's deliberations. The process followed by the Subcommittee is discussed in the next section. 3

Process

1. The subcommittee met on February 27, 2009 for two hours with the following agenda:
   - A 45-minute session was held with the Interim Dean to discuss the Subcommittee charter and his expectations for the group as well as to solicit his perspective on the challenges facing the College of Engineering.
   - An initial discussion then was held among the group to share initial opinions, thoughts, and concerns.
   - Jack McNamara and Mo Samimy were asked to gather input from the AAE and ME faculty, respectively, on the pros and cons of the merger.

2. The subcommittee met on March 6, 2009 for two hours with the following agenda:
   - Separate 30 minute sessions were held with the current Chairpersons of the AAE and ME Departments to solicit their perspectives on the options proposed by PPAT for consideration by the Interim Dean.
   - An initial discussion among the members was begun to develop pros and cons of the options presented by the Interim Dean. It was decided during this discussion to not develop any further the so called third option – "a well defined and formal collaboration mechanism" - as it did not seem to be compatible with the concerns articulated by the PPAT as well as those of the Interim Dean. The report therefore will focus on the remaining two options, namely Option 1 (merger of AAE with ME) and Option 2 (transfer of several ME faculty with aerospace research to AAE).
   - National standing and visibility of aerospace departments as well as combined mechanical and aerospace departments in the U.S. were discussed.
   - It was also decided to invite two professors from the Mechanical Engineering Department, who would be 2 of the 5 ME faculty to transfer to AE under Option 2, to meeting with the Subcommittee to address the following two questions:

     i. Would the individual be willing to consider a move from the Mechanical Engineering Department to the Aeronautical and Astronautical Engineering Department?
     ii. If the individual was willing to consider such a move what would be the necessary terms and conditions for that person to agree with such a move?

   - This decision to invite these two individuals to meet with Subcommittee and address the above questions was based upon the subcommittee's belief that at least these two faculty members would need to move to AAE for the second option to be viable. Mo Samimy agreed to invite the two individuals to attend the March 13 meeting and he did so by email.

3. The subcommittee met on March 13, 2009 for four hours with the following agenda:
   - Separate 20 minutes sessions were held with the two ME faculty to listen to their responses to the two questions posed and engage in follow on dialogue. The Subcommittee appreciated very much not only the willingness of both individuals to meet with the Subcommittee but also the openness and candor each individual displayed.

- Important data, which included the research funding in 2008 for both departments (at the individual faculty level) as well as the overall department statistics (e.g. rankings, number of graduate students/faculty), were discussed.

- The remainder of the time was spent discussing and developing an initial list of pros and cons for each of the two remaining options as well as recommendations for the Interim Dean as to what steps would be necessary to improve the probability of success for each option. Copies of the draft listing of pros and cons were provided to each member and the following post meeting steps were agreed upon in order to finish the report and provide it to the Interim Dean:
  i. Joe Shaw agreed to draft the Background and Process Sections of the document and provide to Mo Samimy for integration into the rest of the draft.

  ii. Mo Samimy agreed to develop a draft of the remaining sections of the report and then circulate the complete draft to all committee members for review and comment leading to a final document that would be the consensus document of all members.

  iii. Mo Samimy agreed to discuss with Interim Dean how he would like to receive the Subcommittee's report (e.g. written document only, written document with oral debrief by the Subcommittee).

Introduction

Ohio became the birth place of aerospace when the Wright Brothers conceived the idea of and designed the first airplane. OSU is arguably the best location in the U.S. for the aerospace education and research because of its central location with respect to NASA Glenn Research Center (NASA GRC) 120 miles due north, Air Force Research Laboratory (AFRL) 75 miles due west, and the GE Aviation 90 miles due south, in addition to multitude of smaller companies with aerospace products, research and development activities. NASA GRC is one of the Agency's ten field centers in the country and is the only NASA center with focus on aero-propulsion. This is an area in which OSU has significant presence and visibility in the country. Note that a major part of the aero-propulsion research at OSU is currently located in ME. AFRL at Wright Patterson Air Force Base is the largest U.S. Air Force laboratory that houses the Propulsion and Air Vehicle Directorates among a few others. Again OSU has significant presence and visibility in the country in both areas. GE is the largest gas turbine engine manufacturer in the world. Once again, OSU has very strong ties with GE and has national presence in gas turbine research. Therefore, OSU must make every effort to keep its presence and to improve its prominence in the aerospace area.

Mechanical engineering is in general a multidisciplinary engineering department with teaching and research in a wide variety of subject and application areas. Department of Mechanical Engineering at OSU is one of the two largest departments in the College of Engineering with currently 44 faculty members and is one of the four top departments identified for enhanced support in the 2008 Doctoral Program and Assessment Plan. The 8 Big Ten ME departments (Northwestern, Wisconsin, Minnesota, OSU, Penn State, Michigan, Purdue, Illinois; ordered in terms of number of faculty), all ranked in the top 20 in 2009 national ranking, have faculty numbering from 25 to 53 based on 2008 statistics. Faculty in ME are actively engaged in research across a wide spectrum of topics including

advanced transportation, energy and environmental quality, materials and manufacturing, micro- and nano-technology, and bioengineering. The department has significant presence and national recognition in a number of these areas. There are several well known and very active faculty in the advanced transportation area who are engaged in aerospace research including gas turbine, flow and aero-acoustic control, gas and plasma dynamics and lasers, and aerodynamics.

The Department of Aerospace Engineering is one of the smaller departments in the College of Engineering at OSU with currently 10 faculty members. Active faculty are engaged in research in the areas of turbomachinery, aerodynamics, flow control, aero-acoustics, aero-elasticity, flight dynamics and control, and structural mechanics. There are 5 aerospace engineering departments in the Big Ten; OSU has the smallest department. Penn State is the next closest in size to OSU AAE with 16 faculty members. Each one of the top-ten nationally ranked aerospace departments in the Big Ten (Illinois, Michigan, and Purdue) has over 20 faculty. The AAE at OSU was founded in 1948 and was consistently highly ranked over several decades. While still attracting a strong body of undergraduate students and providing excellent undergraduate education, it has slipped in research activities and ranking since the 1990's. However, as part of a commitment to Aerospace Engineering by the College of Engineering, faculty positions have been provided to AAE to replace recent and impending faculty retirements. Specifically, 6 of the 10 current faculty members have been hired since 2005 (4 senior and 2 junior). Furthermore, 1 of the 10 current AAE faculty members returned to the department in 2007 after a short transfer to ME. In addition there is a search underway for the John Glenn Chair in Space Propulsion and Power, which is endowed by a $10M generous donation by an anonymous donor (the total endowment is $20M of which $10M is for the John Glenn chair in AAE). There is also an open position for a Chair in advanced propulsion through the Ohio Scholar program. In the period since 2005, the Aerospace Engineering Department has significantly increased the level of research funding from external sources. In addition AAE has significantly strengthened its external relations with key external stakeholders such as NASA Glenn and General Electric Aviation. These points indicate the near term successes which have occurred in the reinvigoration and rebuilding of AAE.

Options

As was discussed in the Process Section, the Subcommittee decided during its second meeting to not develop any further the so called third option –"a well defined and formal collaboration mechanism" - as it did not seem to be compatible with the concerns articulated by the PPAT as well as those of the Interim Dean. The report therefore will focus on the remaining two options, Option 1 (merger of AAE with ME) and Option 2 (transfer of several ME faculty with aerospace research to AAE), which discussed in detail below.

Option 1: Merger of AAE and ME

There are strong synergies in both undergraduate and graduate curricula and research activities between ME and AAE at OSU. Therefore, merging these two departments to form a department of Mechanical and Aerospace Engineering (MAE) could significantly benefit both departments, if the merger is executed properly. The merger could significantly enhance the national standing of both areas as well as the College of Engineering. Below is a discussion of important issues for a successful merger, followed by pros and cons of the merger identified by the Subcommittee.

Issues to be Addressed for a Successful Merger of AAE and ME

1. Due to the discussed importance of aerospace engineering to the state of Ohio, it is essential to have aerospace in the combined department's name, Department of Mechanical and Aerospace Engineering.

2. It is essential to retain the aerospace program as an accredited and visible entity within MAE, as the discipline attracts highly talented and motivated undergraduate students and AAE graduates are heavily recruited by aerospace industry. In fact, retaining a visible and identifiable aerospace program within MAE could further enhance the recruitment of high caliber students, as the students could obtain dual-degree in both AAE and ME to improve their employability when there is a down turn in aerospace industry.

3. It is crucial for the combined department to have sufficient resources over the coming years to streamline its operation both in instruction and research areas by recruiting faculty in needed areas to replace the retiring faculty. Therefore, there must be a commitment from the college to assign future vacant faculty positions to MAE.

4. It is important to well integrate the two departments into MAE in order to enhance the interaction among faculty for efficient delivery of instruction as well as to increase research collaboration. ME is currently housed in Scott Laboratory, a world class complex with state of the art lecture rooms, laboratories, and offices. AAE is housed in Bolz Laboratory. With some alteration within the Scott Laboratory complex and with moving some graduate students to Bolz Laboratory, the current AAE faculty could be co-located with ME faculty in Scott Lab. The college should provide resources for this integration, which is so crucial for the successful merger of the two departments.

5. Tenure and promotion "standards and expectations" in the combined department will require attention to achieve uniformity across the combined department.

6. There must be a concerted effort by the college office as well as MAE faculty to proactively promote the advantages of the combined department within the OSU as well as to major stake holders outside of OSU, including prospective students, alumni, funding agencies, and industry.

7. While some details were discussed by this Subcommittee and are presented in this report, there are many more issues that need to be addressed and properly dealt with by a representative implementation team of ME and AAE faculty to make the merger a success. The information provided to the Subcommittee during its deliberation lead to different opinions being formed of the probability of success of such a merger. At least one member felt that based upon information provided the probability of success is at best 10 percent and the likelihood of Aerospace Engineering as a major disappearing at OSU in the not too distant future is high.

Addressing the issues discussed above is critical to provide an environment where the Pros can be realized and most Cons can be mitigated. Addressing these issues specifically enables increasing the interaction among the faculty, retention of visibility of Aerospace activities at OSU, and improving standing of the combined department among its peers. 8

Pros

- Merging of the two departments addresses some important issues raised with the college by the OSU central administration related to improving the standing of the departments and the college given the limited available resources. Therefore, it should be viewed positively by both the college and the central administration.
- There are significant synergies between the two departments in the undergraduate and graduate curricula and the research activities, with a potential for:
    - Broader range of courses available to both undergraduate and graduate students
    - Improved education and employability of students
    - Economies of scale in both undergraduate and graduate instructions
    - Enhanced collaboration among ME and AAE faculty
    - Emphasizing total strength of aerospace engineering at OSU by combining the activities of five ME faculty with significant research and national visibility with the AAE faculty research activities.
    - Spreading of obligation for internal services
    - Enhanced faculty productivity
- A merger provides an opportunity to enhance both departments.

Cons

- There are always challenges associated with merger of two units with differences in cultures. General acceptance of merger by the faculty of both departments is essential to enhance the current strengths of the two departments.
- The merger will be seen externally as "demotion" of AAE. Therefore, there must be a concerted effort to proactively promote the advantages of the combined MAE department.
- The merger could have potential negative impact on ME's standing. However, proper integration and concerted proactive promotion of the advantages can mitigate this negative impact.
- Without the availability of resources for proper integration as well as proactive leadership by both the Dean and the MAE chair and faculty, the merger has a high potential for failure.
- Creation of a merged MAE Department dissolves the visibility of a stand-alone AAE department at OSU in the state of Ohio.

Option 2: Transfer of Several ME Faculty to AAE

As was discussed earlier, there are about 5 externally visible faculty members in the advanced transportation area in ME who are engaged in aerospace research including gas turbine, flow and acoustic control, gas and plasma dynamics and lasers, and aerodynamics. Under this option, some to all of these faculty members would transfer from ME to AAE.

Issues to be Addressed to Enable a Transfer of Faculty from ME to AAE

1. The ME faculty in question must accept the transfer.

2. Both ME and AAE faculty must accept the transfer.

3. Exploratory discussions with several of the key ME faculty in question revealed varying degrees of reluctance to move to AAE.

Pros

- The transfer of 5 active ME faculty to AAE unifies the major aerospace engineering activities at OSU into one AAE department, significantly increases the AAE research activities and graduate student population, and will enhance AAE standing and visibility.

- Increasing the number of AAE faculty will improve AAE teaching, obligations for internal service, and research productivity through economies of scale.

- This option maintains the benefits associated with an autonomous Department of Aerospace Engineering at OSU in the state of Ohio.

Cons

- Pros to enhancing AAE come at a significant expense to ME:
  - The transfer of 5 active ME faculty will significantly reduce the ME research activities and graduate student population which will reduce ME standing and visibility.
  - Decreasing the number of ME faculty will adversely affect ME teaching responsibilities and reduce research productivity of the ME faculty.

Appendix I

Subcommittee's Charge

OSU COLLEGE OF ENGINEERING SUBCOMMITTEE
PERFORMANCE PLAN TASK FORCE SUBCOMMITTEE
SUBCOMMITTEE CHARGE

Introduction

In order to accelerate implementation of the performance plan, a Performance Plan Acceleration Task Force (PPAT) was established. This task force, in the context of the college's fiscal situation, recommendations of the doctoral program assessment, and evolving University planning priorities, made nine specific recommendations for accelerating implementation of the Performance Plan. Subcommittees will analyze ach of the nine recommendations that will involve a merger, elimination or restructure and will advise the Dean and the executive committee on future directions for the college.

Subcommittee Charge

The major task of this subcommittee is to analyze and investigate the recommendation of the PPAT committee that the Aeronautical and Astronautical Engineering department (AAE) be realigned by merger with the Mechanical Engineering department (ME), leading to the creation of the Department of Mechanical and Aerospace Engineering. While the committee **must** address the scenario above, it can also explore other scenarios: 1) The transfer of mechanical engineering faculty involved in aerospace engineering to the aerospace engineering department. 2) A well-defined and formal collaboration mechanism to enhance aerospace engineering, involving the aerospace and mechanical engineering departments. In any proposed scenario it is expected that the committee will list all advantages and disadvantages associated with any choice. In determining the advantages and disadvantages please consult with the College Council on Academic Affairs, departmental faculty, student groups and other entities (see feedback below in other considerations). The feedback can be via email or in person.

Considerations

i) The task team should take note of the current college task force recommendations and the 2003 aerospace engineering education task force recommendations.
ii) Identify the conditions needed for each of the alternatives above to be successful in advancing strategic college goals, and the impact of the college's current fiscal constraints on the likely outcome of each alternative
iii) Define, if appropriate, the collaboration mechanism in item iii) above, and its implementation and ongoing assessment
iv) Assess likely impact on undergraduate and graduate curricula, student progress, and faculty in ME and AE, for alternative i) above, which involves alteration of both academic units and would need to conform to OAA procedures on alteration of academic units (p. 5 of document at http://oaa.osu.edu/curriculum_manual/documents/IIUnivOrg.pdf)

Other Considerations

The subcommittees should consider the following during its work:

- Current and future trends for research nationally. This should include the directions of the National Science Foundation (NSF), Department of Defense (DOD), National Institutes of Health (NIH), the private sector and other funding entities.
- State and local research trends. These trends include the research trends of other colleges at OSU (e.g. College of Medicine, College of Mathematical and Physical Sciences)

- Inputs solicited by the committee from government, academia, industry, and other stakeholders in the research community,
- Campus climate for reorganization and support. Cultural issues in the two organizations
- Past strategic initiatives and strategic structure of benchmarked universities
- Our Land grant mission and the quality of undergraduate education.
- Input from individual faculty experts who may not be on the committee.
- OSU capabilities relative to the competition. (Are we a niche player or can we dominate the space?)
- Interdisciplinary and multi-disciplinary research
- Special background requirements related to specific areas of expertise (i.e. Will there be a need for significant US student participation because of the nature of this work?)

Subcommittee membership

Mo Samimy (ME), Ahmet Kahraman (ME), Joe Shaw (NASA), Jack McNamara (AE), John Brighton (EAD).

Committee Timeline

The committee must have a draft report to the executive committee by March 18th 2009.

APPENDIX C

Dean's Response to Merger Study Group Report

PERFORMANCE PLAN TASK FORCE SUBCOMMITTEE
SUBCOMMITTEE FEEDBACK

Aeronautical and Astronautical Engineering department (AAE) merger with Mechanical Engineering department (ME)

Subcommittee Charge
The major task of this subcommittee is to analyze and investigate the recommendation of the PPAT committee that the Aeronautical and Astronautical Engineering department (AAE) be realigned by merger with the Mechanical Engineering department (ME), leading to the creation of the Department of Mechanical and Aerospace Engineering. While the committee **must** address the scenario above, it can also explore other scenarios: 1) The transfer of mechanical engineering faculty involved in aerospace engineering to the aerospace engineering department. 2) A well-defined and formal collaboration mechanism to enhance aerospace engineering, involving the aerospace and mechanical engineering departments. In any proposed scenario it is expected that the committee will list all advantages and disadvantages associated with any choice. In determining the advantages and disadvantages please consult with the College Council on Academic Affairs, departmental faculty, student groups and other entities (see feedback below in other considerations). The feedback can be via email or in person.

Considerations
The task team was asked to:
i) Take note of the current college task force recommendations and the 2003 aerospace engineering education task force recommendations.
ii) Identify the conditions needed for each of the scenarios above to be successful in advancing strategic college goals, and the impact of the college's current fiscal constraints on the likely outcome of each alternative
iii) Define, if appropriate, the collaboration mechanism in the third scenario above, and its implementation and ongoing assessment
iv) Assess likely impact on undergraduate and graduate curricula, student progress, and faculty in ME and AE, for the merger scenario above, which involves alteration of both academic units and would need to conform to OAA procedures on alteration of academic units (page 5 of document at

http://oaa.osu.edu/curriculum_manual/documents/IIUnivOrg.pdf)

Dean's Recommendations and Subcommittee feedback
The Interim Dean of engineering has met with your subcommittee along with faculty in ME (3/6/09) and AE (2/27/09). In addition, he has read your report and consulted with individuals in industry and academe. Based on this input the following recommendations are being made:

1. Aeronautical and Astronautical Engineering (AAE) be realigned by merger with Mechanical Engineering (ME), leading to the creation of the Department of Mechanical and Aerospace Engineering (MAE).
2. The Aerospace program will be retained and must remain as an accredited and visible entity within the MAE department.
3. For a period of three years, PBA from vacancies resulting from retirements within the combined unit will be available to hire replacement personnel to the extent this PBA is not applied to college level budget reductions. In order to accomplish this task a transition

committee of ME and AE faculty should be formed to outline how curricula, faculty placement, physical facilities and governance (including tenure and promotion standards and expectations) would be integrated. This committee will also write the formal proposal for a merger as described in page 5 of document at

http://oaa.osu.edu/curriculum_manual/documents/IIUnivOrg.pdf.

This proposal should be completed for college vote by the end of spring quarter 2009 (CCAA by May 15, 2009), with formal process completed by fall quarter 2009.

Other relevant issues as noted in the subcommittee report will need to be addressed. The transition committee should identify these issues and propose appropriate mechanisms for addressing them.

Rationale
In making this determination a number of issues led to this decision:

1. **Will the merger be beneficial to both units?** The college supports AE, which is precisely why this change needs to happen. There is just no more practical way to help AE grow and flourish. This will happen in two ways. First synergy to support Aerospace as a discipline will grow with the addition of 4-5 really good faculty who are essentially aero faculty but are in ME, and based on the discussions with these faculty want to stay there. These faculty members now will be departmental colleagues in the combined department. Second, the senior faculty in Mechanical who conduct Aerospace research coupled with the current AE faculty can provide, in my opinion, much stronger mentoring from a research perspective than "just the current" senior faculty in AE. This change also helps AE become more fiscally sound. There is significant leverage for ME as well as it increases the total size of the department thus providing improved ranking and hiring support for future faculty. It also helps ME become more efficient as there is considerable overlap in the two departments. Finally, there will exist significant opportunities for ME faculty to engage and to work with some of the strongest undergraduate students in the college.

2. **Can a joint department become successful from the perspective of rankings?**
When one examines this from the AE perspective, the assertion that stronger programs are the sole domain of standalone units is not true. There are at least 9 joint ME/AE programs in the top 25. Five of these are ranked higher than OSU/AE and four of these are ranked higher than OSU/ME. There are other joint programs in the top 25 as well with AE combined with Ocean Engineering (1) and Applied Mechanics (3). There are two top 10 departments (both in ME and AE who are joint – Cornell and Princeton).

3. **Will Aero disappear in a merger?**
The idea that the smaller unit will be swallowed up and will disappear is always an issue. To help mitigate this, a number of steps will be developed:
   a. The department will be renamed the Mechanical and Aerospace Engineering Department thus preserving the Aerospace name.
   b. The Aerospace undergraduate and graduate programs will be maintained and the college would like to see a number of the courses in those curricula staffed by faculty from both units. c. A Merger Implementation Committee, (consisting of faculty from both departments) must be formed. This committee will outline how curricula, faculty

placement, physical facilities and governance (including tenure and promotion standards and expectations) would be integrated.

d. We will also work with the chair to properly protect positions and will put in place a plan to help ensure as smooth a transition as possible.

APPENDIX D

Department Space Assignment Report – Mechanical Engineering

Departmental Space Inventory (DSI)
Department 1470 - Mechanical Engineering
Source of Data: Office of Planning and Real Estate "ROOMS" database, file date 09/23/08.

BLDG #	BLDG_NAME	ROOM #	Room Type	Function	AREA	CAP	ORG #	ORG_NAME	COMMENTS
148	SCOTT LAB	E0020	8G STORAGE	F GEN ADMN	115				
148	SCOTT LAB	E0030	8G STORAGE	F GEN ADMN	57				
148	SCOTT LAB	E0100A	6L MEETING	F GEN ADMN	1356	54			
148	SCOTT LAB	E0100B	6L MEETING	F GEN ADMN	1025	41			
148	SCOTT LAB	E0100C	5J OFCE SRV	F GEN ADMN	135				
148	SCOTT LAB	E0100D	5J OFCE SRV	F GEN ADMN	381	5			
148	SCOTT LAB	E0200	2Q UNSH COMP	A INST&SUPRT	2563	42			
148	SCOTT LAB	E0202	3A T LAB SRV	A INST&SUPRT	154				
148	SCOTT LAB	E0203	2Q UNSH COMP	A INST&SUPRT	726	12			
148	SCOTT LAB	E0204	3A T LAB SRV	A INST&SUPRT	342	2			
148	SCOTT LAB	E0205	2Q UNSH COMP	A INST&SUPRT	842	14			
148	SCOTT LAB	E0215	3A T LAB SRV	A INST&SUPRT	339				
148	SCOTT LAB	E0220	5L STAF OFCE	A INST&SUPRT	166	1			
148	SCOTT LAB	E0222	5L STAF OFCE	A INST&SUPRT	154	1			
148	SCOTT LAB	E0225	2Q UNSH COMP	A INST&SUPRT	998	16			
148	SCOTT LAB	E0230	5J OFCE SRV	A INST&SUPRT	154	2			
148	SCOTT LAB	E0231	5J OFCE SRV	A INST&SUPRT	120	2			
148	SCOTT LAB	E0232	5L STAF OFCE	A INST&SUPRT	166	1			
148	SCOTT LAB	E0238	5K CONFERNCE	F GEN ADMN	331	13			
148	SCOTT LAB	E0242	3A T LAB SRV	A INST&SUPRT	156				
148	SCOTT LAB	E0302	5A FAC OFCE	A INST&SUPRT	154	1			
148	SCOTT LAB	E0303	5A FAC OFCE	A INST&SUPRT	183	1			
148	SCOTT LAB	E0305	5A FAC OFCE	A INST&SUPRT	166	1			
148	SCOTT LAB	E0306	5L STAF OFCE	A INST&SUPRT	156	1			
148	SCOTT LAB	E0307	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0309	5A FAC OFCE	A INST&SUPRT	181	1			
148	SCOTT LAB	E0310	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0311	5A FAC OFCE	A INST&SUPRT	180	1			
148	SCOTT LAB	E0313	5F GRAD OFCE	A INST&SUPRT	169	2			
148	SCOTT LAB	E0318	5A FAC OFCE	A INST&SUPRT	166	1			
148	SCOTT LAB	E0320	5L STAF OFCE	F GEN ADMN	154	2			
148	SCOTT LAB	E0323	5J OFCE SRV	F GEN ADMN	86				
148	SCOTT LAB	E0325	5B ADMN OFCE	F GEN ADMN	169	1			
148	SCOTT LAB	E0327	5A FAC OFCE	A INST&SUPRT	181	1			
148	SCOTT LAB	E0328	5L STAF OFCE	F GEN ADMN	154	2			
148	SCOTT LAB	E0329	5A FAC OFCE	A INST&SUPRT	180	1			
148	SCOTT LAB	E0330	5C CLER OFCE	F GEN ADMN	166	2			
148	SCOTT LAB	E0331	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0333	5B ADMN OFCE	F GEN ADMN	169	1			
148	SCOTT LAB	E0335	5B ADMN OFCE	F GEN ADMN	189	1			
148	SCOTT LAB	E0337	5B ADMN OFCE	F GEN ADMN	502	7			
148	SCOTT LAB	E0338	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0339	5K CONFERNCE	F GEN ADMN	343	13			
148	SCOTT LAB	E0340	5A FAC OFCE	A INST&SUPRT	156	1			
148	SCOTT LAB	E0341	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0342	5L STAF OFCE	F GEN ADMN	156	1			
148	SCOTT LAB	E0343	5A FAC OFCE	A INST&SUPRT	180	1			

Prepared By: J. Chris Mulholand
Date: 04/21/09

Departmental Space Inventory (DSI)
Department 1470 - Mechanical Engineering
Source of Data: Office of Planning and Real Estate "ROOMS" database, file date 09/23/08.

BLDG #	BLDG_NAME	ROOM #	Room Type	Function	AREA	CAP	ORG #	ORG_NAME	COMMENTS
148	SCOTT LAB	E0345	5A FAC OFCE	A INST&SUPRT	180	1			
148	SCOTT LAB	E0347	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0349	6E LOUNGE	F GEN ADMN	195				
148	SCOTT LAB	E0402	5A FAC OFCE	A INST&SUPRT	154	1			
148	SCOTT LAB	E0403	5A FAC OFCE	A INST&SUPRT	183	1			
148	SCOTT LAB	E0405	5A FAC OFCE	A INST&SUPRT	166	1			
148	SCOTT LAB	E0406	5A FAC OFCE	A INST&SUPRT	156	1			
148	SCOTT LAB	E0407	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0409	5A FAC OFCE	A INST&SUPRT	181	1			
148	SCOTT LAB	E0410	5A FAC OFCE	A INST&SUPRT	170	1			
148	SCOTT LAB	E0411	5A FAC OFCE	A INST&SUPRT	180	1			
148	SCOTT LAB	E0413	5F GRAD OFCE	A INST&SUPRT	169	2			
148	SCOTT LAB	E0418	5A FAC OFCE	A INST&SUPRT	165	1			
148	SCOTT LAB	E0420	5A FAC OFCE	A INST&SUPRT	154	1			
148	SCOTT LAB	E0423	5J OFCE SRV	F GEN ADMN	86				
148	SCOTT LAB	E0425	5F GRAD OFCE	A INST&SUPRT	169	4			
148	SCOTT LAB	E0427	5A FAC OFCE	A INST&SUPRT	181	1			
148	SCOTT LAB	E0428	5A FAC OFCE	C SPON RSCH	154	1			
148	SCOTT LAB	E0429	5A FAC OFCE	A INST&SUPRT	180	1			
148	SCOTT LAB	E0430	5A FAC OFCE	A INST&SUPRT	165	1			
148	SCOTT LAB	E0431	5A FAC OFCE	C SPON RSCH	169	1			
148	SCOTT LAB	E0433	5K CONFERNCE	F GEN ADMN	168	6			
148	SCOTT LAB	E0435	5K CONFERNCE	F GEN ADMN	190	7			
148	SCOTT LAB	E0437	5F GRAD OFCE	A INST&SUPRT	502	7			
148	SCOTT LAB	E0438	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0439	5K CONFERNCE	F GEN ADMN	343	13			
148	SCOTT LAB	E0440	5B ADMN OFCE	F GEN ADMN	155	1			
148	SCOTT LAB	E0441	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0442	5F GRAD OFCE	A INST&SUPRT	155	1			
148	SCOTT LAB	E0443	5A FAC OFCE	A INST&SUPRT	180	1			
148	SCOTT LAB	E0445	5A FAC OFCE	A INST&SUPRT	180	1			
148	SCOTT LAB	E0447	5F GRAD OFCE	A INST&SUPRT	169	2			
148	SCOTT LAB	E0449	6E LOUNGE	F GEN ADMN	195	4			
148	SCOTT LAB	E0502	5A FAC OFCE	A INST&SUPRT	154	1			
148	SCOTT LAB	E0503	5A FAC OFCE	A INST&SUPRT	183	1			
148	SCOTT LAB	E0505	5A FAC OFCE	A INST&SUPRT	166	1			
148	SCOTT LAB	E0506	5A FAC OFCE	A INST&SUPRT	156	1			
148	SCOTT LAB	E0507	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0509	5A FAC OFCE	A INST&SUPRT	181	1			
148	SCOTT LAB	E0510	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0513	5F GRAD OFCE	A INST&SUPRT	355	5			
148	SCOTT LAB	E0518	5A FAC OFCE	A INST&SUPRT	166	1			
148	SCOTT LAB	E0520	5A FAC OFCE	A INST&SUPRT	154	1			
148	SCOTT LAB	E0523	5J OFCE SRV	F GEN ADMN	86				
148	SCOTT LAB	E0525	5K CONFERNCE	F GEN ADMN	814	32			
148	SCOTT LAB	E0528	5A FAC OFCE	A INST&SUPRT	154	1			
148	SCOTT LAB	E0530	5A FAC OFCE	A INST&SUPRT	166	1			

Prepared By: J. Chris Mulholand
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Department 1470 - Mechanical Engineering
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BLDG #	BLDG_NAME	ROOM #	Room Type	Function	AREA	CAP	ORG #	ORG_NAME	COMMENTS
148	SCOTT LAB	E0533	5K CONFERNCE	F GEN ADMN	356	14			
148	SCOTT LAB	E0538	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0539	6E LOUNGE	F GEN ADMN	762				
148	SCOTT LAB	E0539A	6E LOUNGE	F GEN ADMN	96				
148	SCOTT LAB	E0540	5A FAC OFCE	A INST&SUPRT	156	1			
148	SCOTT LAB	E0541	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0542	5A FAC OFCE	A INST&SUPRT	156	1			
148	SCOTT LAB	E0543	5A FAC OFCE	A INST&SUPRT	180	1			
148	SCOTT LAB	E0545	5A FAC OFCE	A INST&SUPRT	180	1			
148	SCOTT LAB	E0547	5A FAC OFCE	A INST&SUPRT	169	1			
148	SCOTT LAB	E0549	6E LOUNGE	F GEN ADMN	195	4			
148	SCOTT LAB	N0146	4A STUDY	G STUDNT SRV	282	11			
148	SCOTT LAB	N0146A	6H LOCKER RM	G STUDNT SRV	204				
148	SCOTT LAB	N0147	5E STD ACTIV	G STUDNT SRV	132	1			
148	SCOTT LAB	N0148	4A STUDY	G STUDNT SRV	140	6			
148	SCOTT LAB	N0148A	6H LOCKER RM	G STUDNT SRV	204				
148	SCOTT LAB	N0149	6E LOUNGE	F GEN ADMN	66	1			
148	SCOTT LAB	N0151	2Q UNSH COMP	A INST&SUPRT	573	18			
148	SCOTT LAB	N0152	4A STUDY	G STUDNT SRV	140	6			
148	SCOTT LAB	N0152A	6H LOCKER RM	G STUDNT SRV	204				
148	SCOTT LAB	N0154	4A STUDY	G STUDNT SRV	140	6			
148	SCOTT LAB	N0154A	6H LOCKER RM	G STUDNT SRV	204				
148	SCOTT LAB	N0155	6E LOUNGE	G STUDNT SRV	659				
148	SCOTT LAB	N0156	4A STUDY	G STUDNT SRV	138	6			
148	SCOTT LAB	N0250	5C CLER OFCE	F GEN ADMN	377	5			
148	SCOTT LAB	N0250A	6L MEETING	F GEN ADMN	250	10			
148	SCOTT LAB	N0250B	5L STAF OFCE	A INST&SUPRT	160	1			
148	SCOTT LAB	N0250C	5J OFCE SRV	F GEN ADMN	301				
148	SCOTT LAB	N0250D	5L STAF OFCE	A INST&SUPRT	160	1			
148	SCOTT LAB	N0250E	6E LOUNGE	F GEN ADMN	160	6			
148	SCOTT LAB	N0250F	5L STAF OFCE	A INST&SUPRT	160	1			
148	SCOTT LAB	N0250G	5L STAF OFCE	A INST&SUPRT	160	1			
148	SCOTT LAB	N0250H	5L STAF OFCE	F GEN ADMN	160	1			
148	SCOTT LAB	N0250K	6L MEETING	F GEN ADMN	160	6			
148	SCOTT LAB	N0250L	5L STAF OFCE	A INST&SUPRT	165	1			
148	SCOTT LAB	N0250N	5J OFCE SRV	F GEN ADMN	133				
148	SCOTT LAB	N0252	5E STD ACTIV	G STUDNT SRV	144	2			
148	SCOTT LAB	N0253	4A STUDY	G STUDNT SRV	164	2			
148	SCOTT LAB	N0254	5E STD ACTIV	G STUDNT SRV	128	2			
148	SCOTT LAB	N0255	4A STUDY	G STUDNT SRV	162	4			
148	SCOTT LAB	N0256	4A STUDY	G STUDNT SRV	192				
148	SCOTT LAB	N0257	6L MEETING	A INST&SUPRT	414	14			
148	SCOTT LAB	N0350	5J OFCE SRV	F GEN ADMN	240				
148	SCOTT LAB	N0350A	5K CONFERNCE	F GEN ADMN	237	9			
148	SCOTT LAB	N0350B	5C CLER OFCE	F GEN ADMN	231	2			
148	SCOTT LAB	N0350C	5B ADMN OFCE	F GEN ADMN	338	3			
148	SCOTT LAB	N0350D	5J OFCE SRV	F GEN ADMN	46				

Prepared By: J. Chris Mulholand
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Departmental Space Inventory (DSI)
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BLDG #	BLDG_NAME	ROOM #	Room Type	Function	AREA	CAP	ORG #	ORG_NAME	COMMENTS
148	SCOTT LAB	N0350E	5J OFCE SRV	F GEN ADMN	113				
148	SCOTT LAB	N0350F	5L STAF OFCE	F GEN ADMN	160	1			
148	SCOTT LAB	N0350G	5J OFCE SRV	F GEN ADMN	93				
148	SCOTT LAB	N0350K	5L STAF OFCE	F GEN ADMN	160	1			
148	SCOTT LAB	N0350L	5L STAF OFCE	F GEN ADMN	160	1			
148	SCOTT LAB	N0350N	5J OFCE SRV	F GEN ADMN	121				
148	SCOTT LAB	N0350P	5J OFCE SRV	F GEN ADMN	115				
148	SCOTT LAB	N0350Q	5L STAF OFCE	F GEN ADMN	160	1			
148	SCOTT LAB	N0350R	5L STAF OFCE	F GEN ADMN	160	1			
148	SCOTT LAB	N0350S	5L STAF OFCE	F GEN ADMN	115	1			
148	SCOTT LAB	N0350U	5L STAF OFCE	F GEN ADMN	165	1			
148	SCOTT LAB	N0350V	5J OFCE SRV	F GEN ADMN	137				
148	SCOTT LAB	N0350W	5J OFCE SRV	F GEN ADMN	48				
148	SCOTT LAB	N0353	5K CONFERNCE	F GEN ADMN	365	14			
148	SCOTT LAB	N0355	6E LOUNGE	F GEN ADMN	373	8			
148	SCOTT LAB	W0061	2D RESCH LAB	C SPON RSCH	624	9			
148	SCOTT LAB	W0066	2D RESCH LAB	C SPON RSCH	838	12			
148	SCOTT LAB	W0068	2D RESCH LAB	C SPON RSCH	166	1			
148	SCOTT LAB	W0069	2D RESCH LAB	C SPON RSCH	901	12			
148	SCOTT LAB	W0070	2D RESCH LAB	C SPON RSCH	509	7			
148	SCOTT LAB	W0071	2D RESCH LAB	C SPON RSCH	585	8			
148	SCOTT LAB	W0074	2D RESCH LAB	C SPON RSCH	578	8			
148	SCOTT LAB	W0080	2D RESCH LAB	C SPON RSCH	2819	40			
148	SCOTT LAB	W0080A	2D RESCH LAB	C SPON RSCH	234	2			
148	SCOTT LAB	W0080C	3D R LAB SRV	C SPON RSCH	201				
148	SCOTT LAB	W0088	5F GRAD OFCE	A INST&SUPRT	350	8			
148	SCOTT LAB	W0090	5F GRAD OFCE	A INST&SUPRT	350	7			
148	SCOTT LAB	W0091	2D RESCH LAB	C SPON RSCH	1229	17			
148	SCOTT LAB	W0092	2D RESCH LAB	C SPON RSCH	595	8			
148	SCOTT LAB	W0092A	2D RESCH LAB	C SPON RSCH	131	1			
148	SCOTT LAB	W0094	2D RESCH LAB	C SPON RSCH	131	1			
148	SCOTT LAB	W0096	2D RESCH LAB	C SPON RSCH	925	13			
148	SCOTT LAB	W0097	2D RESCH LAB	C SPON RSCH	831	11			
148	SCOTT LAB	W0098	2D RESCH LAB	C SPON RSCH	268	3			
148	SCOTT LAB	W0162	3A T LAB SRV	A INST&SUPRT	469				
148	SCOTT LAB	W0162A	8G STORAGE	F GEN ADMN	144				
148	SCOTT LAB	W0162B	8G STORAGE	F GEN ADMN	145				
148	SCOTT LAB	W0162C	3A T LAB SRV	A INST&SUPRT	1559				
148	SCOTT LAB	W0162D	2Q UNSH COMP	A INST&SUPRT	150	2			
148	SCOTT LAB	W0162E	2Q UNSH COMP	A INST&SUPRT	336	5			
148	SCOTT LAB	W0170	8A SHOP	A INST&SUPRT	3441	49			
148	SCOTT LAB	W0170A	5L STAF OFCE	A INST&SUPRT	120	1			
148	SCOTT LAB	W0170B	5L STAF OFCE	A INST&SUPRT	145	1			
148	SCOTT LAB	W0170D	3A T LAB SRV	A INST&SUPRT	610	8			
148	SCOTT LAB	W0179	2D RESCH LAB	C SPON RSCH	581	8			
148	SCOTT LAB	W0180	2D RESCH LAB	C SPON RSCH	588	8			
148	SCOTT LAB	W0182	2D RESCH LAB	C SPON RSCH	277	4			

Prepared By: J. Chris Mulholand
Date: 04/21/09

Departmental Space Inventory (DSI)
Department 1470 - Mechanical Engineering
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BLDG #	BLDG_NAME	ROOM #	Room Type	Function	AREA	CAP	ORG #	ORG_NAME	COMMENTS
148	SCOTT LAB	W0183	2D RESCH LAB	C SPON RSCH	543	7			
148	SCOTT LAB	W0183A	3D R LAB SRV	C SPON RSCH	12				
148	SCOTT LAB	W0184	2D RESCH LAB	B DEPT RSCH	274	4			
148	SCOTT LAB	W0185	2D RESCH LAB	B DEPT RSCH	264	3			
148	SCOTT LAB	W0186	2D RESCH LAB	C SPON RSCH	266	3			
148	SCOTT LAB	W0188	5F GRAD OFCE	A INST&SUPRT	197	2			
148	SCOTT LAB	W0190	5K CONFERNCE	F GEN ADMN	182	7			
148	SCOTT LAB	W0191	2D RESCH LAB	C SPON RSCH	599	8			
148	SCOTT LAB	W0192	5F GRAD OFCE	A INST&SUPRT	380	5			
148	SCOTT LAB	W0194	2D RESCH LAB	C SPON RSCH	915	13			
148	SCOTT LAB	W0195	2D RESCH LAB	C SPON RSCH	595	8			
148	SCOTT LAB	W0196	2D RESCH LAB	C SPON RSCH	274	4			
148	SCOTT LAB	W0197	2D RESCH LAB	C SPON RSCH	860	12			
148	SCOTT LAB	W0198	2D RESCH LAB	C SPON RSCH	634	9			
148	SCOTT LAB	W0258	2A SCHED LAB	A INST&SUPRT	633	9			
148	SCOTT LAB	W0259	2A SCHED LAB	A INST&SUPRT	1472	21			
148	SCOTT LAB	W0260	2K UNSCHD LB	A INST&SUPRT	913	13			
148	SCOTT LAB	W0265	3A T LAB SRV	A INST&SUPRT	278				
148	SCOTT LAB	W0268	2K UNSCHD LB	A INST&SUPRT	596	15			
148	SCOTT LAB	W0269	2K UNSCHD LB	A INST&SUPRT	593	8			
148	SCOTT LAB	W0270	2A SCHED LAB	A INST&SUPRT	592	8			
148	SCOTT LAB	W0271	2K UNSCHD LB	A INST&SUPRT	274	4			
148	SCOTT LAB	W0273	3A T LAB SRV	A INST&SUPRT	434				
148	SCOTT LAB	W0276	2A SCHED LAB	A INST&SUPRT	595	14			
148	SCOTT LAB	W0277	2A SCHED LAB	A INST&SUPRT	438	8			
148	SCOTT LAB	W0279	2K UNSCHD LB	A INST&SUPRT	597	8			
148	SCOTT LAB	W0282	2A SCHED LAB	A INST&SUPRT	884	12			
148	SCOTT LAB	W0285	2K UNSCHD LB	A INST&SUPRT	593	13			
148	SCOTT LAB	W0286	2A SCHED LAB	A INST&SUPRT	905	13			
148	SCOTT LAB	W0287	2K UNSCHD LB	A INST&SUPRT	585	8			
148	SCOTT LAB	W0292	5F GRAD OFCE	A INST&SUPRT	398	5			
148	SCOTT LAB	W0294	2K UNSCHD LB	A INST&SUPRT	916	13			
148	SCOTT LAB	W0295	2K UNSCHD LB	A INST&SUPRT	907	13			
148	SCOTT LAB	W0296	5F GRAD OFCE	A INST&SUPRT	398	7			
148	SCOTT LAB	W0298	3A T LAB SRV	A INST&SUPRT	684	9			
148	SCOTT LAB	W0298A	5L STAF OFCE	F GEN ADMN	116	1			
148	SCOTT LAB	W0298B	5L STAF OFCE	A INST&SUPRT	113	1			
148	SCOTT LAB	W0299	3A T LAB SRV	A INST&SUPRT	1139	16			
148	SCOTT LAB	W0299A	5L STAF OFCE	A INST&SUPRT	120	1			
148	SCOTT LAB	W0358	2D RESCH LAB	C SPON RSCH	633	9			
148	SCOTT LAB	W0359	2D RESCH LAB	C SPON RSCH	864	12			
148	SCOTT LAB	W0360	2D RESCH LAB	C SPON RSCH	595	8			
148	SCOTT LAB	W0363	2D RESCH LAB	C SPON RSCH	595	8			
148	SCOTT LAB	W0364	2D RESCH LAB	B DEPT RSCH	279	4			
148	SCOTT LAB	W0365	2D RESCH LAB	C SPON RSCH	278	4			
148	SCOTT LAB	W0374	3D R LAB SRV	B DEPT RSCH	124				
148	SCOTT LAB	W0374A	3D R LAB SRV	B DEPT RSCH	147				

Prepared By: J. Chris Mulholand
Date: 04/21/09

Departmental Space Inventory (DSI)
Department 1470 - Mechanical Engineering
Source of Data: Office of Planning and Real Estate "ROOMS" database, file date 09/23/08.

BLDG #	BLDG_NAME	ROOM #	Room Type	Function	AREA	CAP	ORG #	ORG_NAME	COMMENTS
148	SCOTT LAB	W0374B	2D RESCH LAB	B DEPT RSCH	936	13			
148	SCOTT LAB	W0374C	2D RESCH LAB	B DEPT RSCH	302	4			
148	SCOTT LAB	W0374D	2D RESCH LAB	B DEPT RSCH	935	13			
148	SCOTT LAB	W0374E	2D RESCH LAB	B DEPT RSCH	616	8			
148	SCOTT LAB	W0376	2D RESCH LAB	B DEPT RSCH	592	8			
148	SCOTT LAB	W0380	2D RESCH LAB	B DEPT RSCH	594	8			
148	SCOTT LAB	W0381	2D RESCH LAB	B DEPT RSCH	592	8			
148	SCOTT LAB	W0382	2D RESCH LAB	B DEPT RSCH	898	12			
148	SCOTT LAB	W0383	2D RESCH LAB	B DEPT RSCH	589	8			
148	SCOTT LAB	W0386	2D RESCH LAB	B DEPT RSCH	273	4			
148	SCOTT LAB	W0387	2D RESCH LAB	C SPON RSCH	587	8			
148	SCOTT LAB	W0388	2D RESCH LAB	C SPON RSCH	602	8			
148	SCOTT LAB	W0390	5L STAF OFCE	F GEN ADMN	384	3			
148	SCOTT LAB	W0391	2D RESCH LAB	C SPON RSCH	601	8			
148	SCOTT LAB	W0392	5F GRAD OFCE	A INST&SUPRT	182	3			
148	SCOTT LAB	W0394	5A FAC OFCE	A INST&SUPRT	182	1			
148	SCOTT LAB	W0395	2D RESCH LAB	C SPON RSCH	273	4			
148	SCOTT LAB	W0396	2D RESCH LAB	C SPON RSCH	613	8			
148	SCOTT LAB	W0397	2D RESCH LAB	C SPON RSCH	273	4			
148	SCOTT LAB	W0398	2D RESCH LAB	B DEPT RSCH	634	9			
148	SCOTT LAB	W0399	2D RESCH LAB	C SPON RSCH	864	12			
148	SCOTT LAB	W0458	2D RESCH LAB	C SPON RSCH	633	9			
148	SCOTT LAB	W0459	2D RESCH LAB	C SPON RSCH	866	12			
148	SCOTT LAB	W0460	2D RESCH LAB	C SPON RSCH	566	8			
148	SCOTT LAB	W0460A	3D R LAB SRV	C SPON RSCH	26				
148	SCOTT LAB	W0463	2D RESCH LAB	C SPON RSCH	595	8			
148	SCOTT LAB	W0464	2D RESCH LAB	C SPON RSCH	278	4			
148	SCOTT LAB	W0465	2D RESCH LAB	C SPON RSCH	225	3			
148	SCOTT LAB	W0465A	3D R LAB SRV	B DEPT RSCH	25				
148	SCOTT LAB	W0465B	3D R LAB SRV	B DEPT RSCH	24				
148	SCOTT LAB	W0468	2D RESCH LAB	C SPON RSCH	595	8			
148	SCOTT LAB	W0469	2D RESCH LAB	C SPON RSCH	594	8			
148	SCOTT LAB	W0470	2D RESCH LAB	C SPON RSCH	592	8			
148	SCOTT LAB	W0471	2D RESCH LAB	C SPON RSCH	275	4			
148	SCOTT LAB	W0473	2D RESCH LAB	B DEPT RSCH	275	4			
148	SCOTT LAB	W0474	2D RESCH LAB	C SPON RSCH	263	3			
148	SCOTT LAB	W0475	2D RESCH LAB	B DEPT RSCH	263	3			
148	SCOTT LAB	W0477	2D RESCH LAB	C SPON RSCH	596	8			
148	SCOTT LAB	W0478	2D RESCH LAB	C SPON RSCH	609	8			
148	SCOTT LAB	W0481	2D RESCH LAB	C SPON RSCH	589	8			
148	SCOTT LAB	W0482	2D RESCH LAB	C SPON RSCH	589	8			
148	SCOTT LAB	W0485	2D RESCH LAB	B DEPT RSCH	590	8			
148	SCOTT LAB	W0486	2D RESCH LAB	C SPON RSCH	892	12			
148	SCOTT LAB	W0488	5A FAC OFCE	A INST&SUPRT	197	1			
148	SCOTT LAB	W0489	2D RESCH LAB	B DEPT RSCH	263	3			
148	SCOTT LAB	W0490	2D RESCH LAB	C SPON RSCH	910	13			
148	SCOTT LAB	W0490A	2D RESCH LAB	C SPON RSCH	281	4			

Prepared By: J. Chris Mulholand
Date: 04/21/09

Departmental Space Inventory (DSI)
Department 1470 - Mechanical Engineering
Source of Data: Office of Planning and Real Estate "ROOMS" database, file date 09/23/08.

BLDG #	BLDG_NAME	ROOM #	Room Type		Function		AREA	CAP	ORG #	ORG_NAME	COMMENTS
148	SCOTT LAB	W0491	2D	RESCH LAB	C	SPON RSCH	601	8			
148	SCOTT LAB	W0492	5K	CONFERNCE	F	GEN ADMN	182	7			
148	SCOTT LAB	W0494	5F	GRAD OFCE	A	INST&SUPRT	182	2			
148	SCOTT LAB	W0496	5A	FAC OFCE	A	INST&SUPRT	179	1			
148	SCOTT LAB	W0497	2D	RESCH LAB	C	SPON RSCH	589	8			
148	SCOTT LAB	W0498	2D	RESCH LAB	C	SPON RSCH	631	9			
148	SCOTT LAB	W0499	2D	RESCH LAB	C	SPON RSCH	864	12			
155	RAD DOSIM	0100	5B	ADMN OFCE	N	NON INSTIT	345	1			LEASED TO OHIO EMER MNGMT AGCY
155	RAD DOSIM	0101	5G	OFCE LAB	N	NON INSTIT	470	5			LEASED TO OHIO EMER MNGMT AGCY
155	RAD DOSIM	0105	2M	SPECL LAB	N	NON INSTIT	674	4			LEASED TO OHIO EMER MNGMT AGCY
155	RAD DOSIM	0110	8A	SHOP	N	NON INSTIT	1069				LEASED TO OHIO EMER MNGMT AGCY
155	RAD DOSIM	0110A	8B	SHOP SRV	N	NON INSTIT	80				LEASED TO OHIO EMER MNGMT AGCY
155	RAD DOSIM	0110B	8B	SHOP SRV	N	NON INSTIT	203				LEASED TO OHIO EMER MNGMT AGCY
155	RAD DOSIM	0112	8B	SHOP SRV	N	NON INSTIT	1486				LEASED TO OHIO EMER MNGMT AGCY
155	RAD DOSIM	0112A	8B	SHOP SRV	N	NON INSTIT	471				LEASED TO OHIO EMER MNGMT AGCY

Prepared By: J. Chris Mulholand
Date: 04/21/09

APPENDIX E

Department Space Assignment Report – Aerospace Engineering

Departmental Space Inventory (DSI)
Department 1407 - Aerospace Engineering
Source of Data: Office of Planning and Real Estate "ROOMS" database, file date 09/23/08.

BLDG #	BLDG_NAME	ROOM #	Room Type	Function	AREA	CAP	ORG #	ORG_NAME	COMMENTS
146	BOLZ HALL	0101	2M SPECL LAB	A INST&SUPRT	832	35			PROPULSION LAB
146	BOLZ HALL	0101A	2M SPECL LAB	A INST&SUPRT	160	1			ROCKET PIT
146	BOLZ HALL	0101B	2M SPECL LAB	A INST&SUPRT	161	1			ROCKET PIT
146	BOLZ HALL	0101C	2M SPECL LAB	A INST&SUPRT	161	1			ROCKET PIT
146	BOLZ HALL	0102	2M SPECL LAB	A INST&SUPRT	2385	35			LOW SPEED WIND TUNNEL
146	BOLZ HALL	0103	2K UNSCHD LB	A INST&SUPRT	738	15			
146	BOLZ HALL	0104	3A T LAB SRV	A INST&SUPRT	1198				
146	BOLZ HALL	0106	3A T LAB SRV	A INST&SUPRT	231				
146	BOLZ HALL	0110	8A SHOP	A INST&SUPRT	1332				
146	BOLZ HALL	0110A	8B SHOP SRV	A INST&SUPRT	230				
146	BOLZ HALL	0110B	8B SHOP SRV	A INST&SUPRT	284				
146	BOLZ HALL	0112	2K UNSCHD LB	A INST&SUPRT	1424	16			
146	BOLZ HALL	0112A	4A STUDY	A INST&SUPRT	455				
146	BOLZ HALL	0114	1B CLASSROOM	A INST&SUPRT	818	40			
146	BOLZ HALL	0319	5A FAC OFCE	A INST&SUPRT	177	1			
146	BOLZ HALL	0319A	5A FAC OFCE	A INST&SUPRT	149	1			
146	BOLZ HALL	0319B	5A FAC OFCE	A INST&SUPRT	149	1			
146	BOLZ HALL	0319C	5A FAC OFCE	A INST&SUPRT	141	1			
146	BOLZ HALL	0319D	5J OFCE SRV	A INST&SUPRT	39				
146	BOLZ HALL	0320	5J OFCE SRV	A INST&SUPRT	371				
146	BOLZ HALL	0320A	5J OFCE SRV	A INST&SUPRT	40				
146	BOLZ HALL	0320B	5A FAC OFCE	A INST&SUPRT	149	1			
146	BOLZ HALL	0320C	5A FAC OFCE	A INST&SUPRT	149	1			
146	BOLZ HALL	0320D	5A FAC OFCE	A INST&SUPRT	149	1			
146	BOLZ HALL	0320E	5A FAC OFCE	A INST&SUPRT	149	1			
146	BOLZ HALL	0320F	5A FAC OFCE	A INST&SUPRT	149	1			
146	BOLZ HALL	0320G	5A FAC OFCE	A INST&SUPRT	149	1			
146	BOLZ HALL	0320H	5J OFCE SRV	A INST&SUPRT	40				
146	BOLZ HALL	0323	2D RESCH LAB	C SPON RSCH	220	4			
146	BOLZ HALL	0323A	2D RESCH LAB	C SPON RSCH	141	2			
146	BOLZ HALL	0323B	2D RESCH LAB	C SPON RSCH	151	3			
146	BOLZ HALL	0323C	2D RESCH LAB	C SPON RSCH	141	3			
146	BOLZ HALL	0326	2Q UNSH COMP	A INST&SUPRT	322	18			
146	BOLZ HALL	0328	5J OFCE SRV	F GEN ADMN	278				
146	BOLZ HALL	0328A	5C CLER OFCE	F GEN ADMN	208	1			
146	BOLZ HALL	0328B	5B ADMN OFCE	F GEN ADMN	335	1			
146	BOLZ HALL	0330	5C CLER OFCE	F GEN ADMN	402	3			
146	BOLZ HALL	0331	5J OFCE SRV	F GEN ADMN	27				
146	BOLZ HALL	0332	5H GEN OFCE	A INST&SUPRT	73	1			
146	BOLZ HALL	0332B	5F GRAD OFCE	B DEPT RSCH	176	5			
146	BOLZ HALL	0333	5K CONFERNCE	A INST&SUPRT	342	12			
146	BOLZ HALL	0334	5A FAC OFCE	A INST&SUPRT	105	1			
146	BOLZ HALL	0335	4A STUDY	A INST&SUPRT	203	5			
146	BOLZ HALL	0336	5A FAC OFCE	A INST&SUPRT	115	1			
146	BOLZ HALL	0339	5F GRAD OFCE	A INST&SUPRT	116	2			
146	BOLZ HALL	0341	5F GRAD OFCE	A INST&SUPRT	116	2			
146	BOLZ HALL	0343	5F GRAD OFCE	A INST&SUPRT	116	2			
146	BOLZ HALL	0345	5A FAC OFCE	A INST&SUPRT	116	1			

Prepared By: J. Chris Mulholand
Date: 04/21/09

Departmental Space Inventory (DSI)
Department 1407 - Aerospace Engineering
Source of Data: Office of Planning and Real Estate "ROOMS" database, file date 09/23/08.

BLDG #	BLDG_NAME	ROOM #	Room Type	Function	AREA	CAP	ORG #	ORG_NAME	COMMENTS
199	A&A RESLAB	0100	5K CONFERNCE	C SPON RSCH	757	30			
199	A&A RESLAB	0100A	5J OFCE SRV	C SPON RSCH	26				
199	A&A RESLAB	0100B	5J OFCE SRV	C SPON RSCH	22				
199	A&A RESLAB	0100C	5J OFCE SRV	C SPON RSCH	27				
199	A&A RESLAB	0107	5C CLER OFCE	C SPON RSCH	310	2			
199	A&A RESLAB	0107A	5A FAC OFCE	C SPON RSCH	157	1			
199	A&A RESLAB	0111	5A FAC OFCE	C SPON RSCH	152	1			
199	A&A RESLAB	0114	5H GEN OFCE	C SPON RSCH	168	1			
199	A&A RESLAB	0115	5A FAC OFCE	C SPON RSCH	151	1			
199	A&A RESLAB	0116	7P DATA PROC	C SPON RSCH	250	5			
199	A&A RESLAB	0117	5A FAC OFCE	C SPON RSCH	151	1			
199	A&A RESLAB	0121	2M SPECL LAB	C SPON RSCH	11042	20			GAS TURBINE LAB
199	A&A RESLAB	0121A	3D R LAB SRV	C SPON RSCH	379	2			
199	A&A RESLAB	0121B	3D R LAB SRV	C SPON RSCH	180	1			
199	A&A RESLAB	0124	5J OFCE SRV	C SPON RSCH	94				
199	A&A RESLAB	0125	3D R LAB SRV	C SPON RSCH	3595				
199	A&A RESLAB	0125A	3D R LAB SRV	C SPON RSCH	180				
199	A&A RESLAB	0129	3D R LAB SRV	C SPON RSCH	3285	66			
199	A&A RESLAB	0150	5A FAC OFCE	C SPON RSCH	165	1			
199	A&A RESLAB	0152	5F GRAD OFCE	C SPON RSCH	166	3			
199	A&A RESLAB	0153	5J OFCE SRV	C SPON RSCH	162				
199	A&A RESLAB	0154	5H GEN OFCE	C SPON RSCH	548	5			
199	A&A RESLAB	0156	5A FAC OFCE	C SPON RSCH	164	1			
199	A&A RESLAB	0158	5L STAF OFCE	C SPON RSCH	166	1			
199	A&A RESLAB	0162	5L STAF OFCE	C SPON RSCH	136	1			
199	A&A RESLAB	0163	7P DATA PROC	C SPON RSCH	712				
199	A&A RESLAB	0166	5A FAC OFCE	C SPON RSCH	161	1			
199	A&A RESLAB	0169	2D RESCH LAB	C SPON RSCH	944	10			
199	A&A RESLAB	0170	5L STAF OFCE	C SPON RSCH	163	1			
199	A&A RESLAB	0171	2D RESCH LAB	C SPON RSCH	1738	15			
199	A&A RESLAB	0171A	2D RESCH LAB	C SPON RSCH	1960	15			
199	A&A RESLAB	0171B	2D RESCH LAB	C SPON RSCH	696	2			
199	A&A RESLAB	0171E	5F GRAD OFCE	C SPON RSCH	566	7			
199	A&A RESLAB	0171H	3D R LAB SRV	C SPON RSCH	108				
199	A&A RESLAB	0171K	3D R LAB SRV	C SPON RSCH	123				
199	A&A RESLAB	0173	5F GRAD OFCE	C SPON RSCH	323	8			
199	A&A RESLAB	0174	5F GRAD OFCE	C SPON RSCH	163	3			
199	A&A RESLAB	0176	5L STAF OFCE	C SPON RSCH	231	2			
199	A&A RESLAB	0177	5F GRAD OFCE	C SPON RSCH	167	2			
199	A&A RESLAB	0183	5F GRAD OFCE	C SPON RSCH	38	1			
199	A&A RESLAB	0183B	5F GRAD OFCE	C SPON RSCH	101	1			
199	A&A RESLAB	0183C	5F GRAD OFCE	C SPON RSCH	104	1			
199	A&A RESLAB	0183D	5F GRAD OFCE	C SPON RSCH	81	1			
199	A&A RESLAB	0186	2M SPECL LAB	C SPON RSCH	3506	15			HYPERSONIC & SUPERSONIC WIND TUNNEL
199	A&A RESLAB	0190	2M SPECL LAB	C SPON RSCH	2380	15			SUBSONIC WIND TUNNEL
199	A&A RESLAB	0190A	2M SPECL LAB	C SPON RSCH	300	5			ROCKET PIT-EXPLOSION ON RESISTANT
199	A&A RESLAB	0190C	2M SPECL LAB	C SPON RSCH	302	5			ROCKET PIT-EXPLOSION ON RESISTANT

Prepared By: J. Chris Mulholand
Date: 04/21/09

Departmental Space Inventory (DSI)
Department 1407 - Aerospace Engineering
Source of Data: Office of Planning and Real Estate "ROOMS" database, file date 09/23/08.

BLDG #	BLDG_NAME	ROOM #	Room Type	Function	AREA	CAP	ORG #	ORG_NAME	COMMENTS
199	A&A RESLAB	0190D	2M SPECL LAB	C SPON RSCH	287	5			THERMAL DYNAMICS OPTICAL LASER SYST
199	A&A RESLAB	0190E	2M SPECL LAB	C SPON RSCH	132	2			THERMAL DYNAMICS CONTROL ROOM
199	A&A RESLAB	0195	8G STORAGE	F GEN ADMN	80				

Prepared By: J. Chris Mulholand
Date: 04/21/09

APPENDIX F

Response to Questions from CCAA

Response to Questions from CCAA on Merger of Mechanical Engineering and Aeronautical Engineering (Memo dated June 3, 2009)

Response date: June 8, 2009

The College Committee on Academic Affairs (CCAA) endorsed the merger of Aerospace Engineering and Mechanical Engineering contingent on changes in the proposal to answer 6 clarification questions. These questions are answered in the following, and this document will be included in an appendix to the merger proposal. The responses will also be included where appropriate in the main body of the merger proposal. In all of our responses below, we use Aerospace Engineering (AE) when we refer to the department as that is the current name of the department, though the degrees carry the designation, Aeronautical and Astronautical Engineering (AAE). We hope our doing so does not cause any confusion.

1. The proposal makes only a tenuous argument relating the original rationale for the merger (to correct weaknesses in the PhD program in AAE that were claimed in the Graduate School's recent PhD program review) and the rationale given on page 4 (to combine resources to strengthen both departments). There are no proposed changes to the AAE PhD program. It would therefore be helpful to address the specific weaknesses in the AAE PhD program that were raised by the Graduate School review, and to explain directly how the merger would improve the AAE PhD program in these dimensions.

Response:

The rationale for the merger was discussed by the COE Performance Plan Acceleration Taskforce (PPAT) and by an initial Merger Study Group. Their reports are given in Appendices A and B, respectively, of the merger proposal. The PPAT Task Force identified two major issues that cannot be resolved without a major infusion of resources: a small size of research-active faculty and a small doctoral student population. In the foreseeable future, the COE will have insufficient resources to invest in AE unless it chooses to make significant cuts in the budgets of other productive departments. . Both of the issues noted above are addressed directly by the merger. As discussed in the proposal, ME has seven faculty members who do a significant amount of sponsored AE research, resulting in a step increase in the number of faculty involved in AE research, as perceived by the external peer community. Furthermore, in the merged department, they may be expected to supervise doctoral students in the AE program as there will be no real or perceived impediments for ME faculty to support AE students. In addition, the graduate courses in both AE and ME will be easier to populate in the merged department offering a wider choice of course options to the graduate students. This will increase the desirability of the AE graduate program. Therefore, there is likely to be an eventual increase in the number of AE graduate students. And finally, there are true and significant synergies between the two departments. We expect that both programs will become more efficient and visible because of the increased size, and this will be done without making significant changes to either program. Metrics for a successful merger will be an increase in rankings and funding, and we expect that both of these will show a significant improvement only a few years after approval of the merger.

2. The Subcommittee discussed the impact on untenured faculty and concluded that it would be fairer to current junior faculty in both departments to give each such faculty member the option of choosing review under the P&T criteria and by the faculty of their previous

department, or review under the P&T criteria and by the faculty of the merged department. For example, rather than limiting this choice by a fixed time period of two years after the merger, it would be a relatively minor change to allow the irrevocable choice to be made either at the time of fourth-year review or at the time of promotion and tenure review, whichever comes first for that faculty member. There might be other approaches that would work as well. The key point is that *every current* junior faculty member should have the option, not just those within two years of P&T review.

Response:

The Merger Implementation Committee discussed the length of the transition period for faculty in the merged department. The transition period covers the makeup of the P&T committee and the department policy under which the evaluation would be done. Rationally, there needs to be a time period for the transition because the faculty will evolve over time. In addition, our goal is to begin functioning as one department as soon as possible if the merger is to be successful. A revised P&T policy will be developed by the merged department so both programs will contribute to its development. The expectations for promotion and tenure are very similar in both departments so we do not visualize a significantly different document from what both departments have now. And finally, given the similarity of the two programs, we do not believe that the P&T process is significantly "easier" in one department compared to the other.

Given these considerations, the Merger Implementation Committee decided to recommend the time limits and process already identified in the OAA Policies and Procedures Handbook (Paragraph 3.11). We believe that this is sufficient time for the junior faculty to become comfortable and confident in the merged department.

3. While the faculty vote in Aerospace Engineering was unanimously positive, there were 11 no votes and 7 abstentions from the faculty of Mechanical Engineering. There should be a substantive summary of the issues that were raised and the discussions that took place in the AE and ME faculty meetings before voting, including a concise presentation of the objections that led a number of ME faculty to vote against the merger.

Response:

The merger vote in Mechanical Engineering was not unanimous because some of the faculty in Mechanical Engineering did not believe that the benefits outweighed the potentially negative effects for ME. The issues were discussed in several faculty meetings (Feb. 27, March 6, April 17, May 8 and 15) after the merger was proposed. In some respects, the ME and AE faculties had different concerns. Since the AE vote was unanimous, we will not address the AE specific concerns here. The ME vote was anonymous so we have no way of knowing which faculty members supported the merger and which opposed. However, some of the concerns expressed by ME faculty members at the faculty meetings were:

- In terms of productivity metrics such as department national ranking, graduate students per faculty member, and funding expenditures per faculty member, the AE department's numbers are lower than those in ME. Therefore, some of the ME faculty members believe that by combining ME and AE, the rankings and prestige of ME will be reduced. This issue was discussed at faculty meetings. This is certainly a

legitimate concern, the counterpoint being that the most popular of the graduate program rankings, the US News and World Report rankings, are reputational rather than being based explicitly on numerical productivity measures. Thus, while it is true that the normalized productivity measures for ME faculty members would suffer following the merger, there is reason to expect that with an appropriate communication effort, external perceptions can be maintained at the current high levels for the ME programs, avoiding a drop in its rankings. Provided the merged department is able to effectively invest resources from retirements and resignations, however, the long term effect of the merger should be an improvement in the rankings for both graduate programs.

- All of the research spaces in Scott Lab and most of the offices are already assigned. Some of the faculty members believe that space resources in the department will be put under significant pressure once the faculty and students in AE become co-inhabitants in Scott Lab. It was pointed out that the space AE occupies in Bolz Hall will come with AE in the merger. By having access to both buildings, we believe that we can optimize the usage so that it will be a win-win situation for both departments. Furthermore, the ME department has in place a policy and criteria to reassign research spaces periodically to faculty based on current productivity levels. Therefore, space assignments will be made in a manner most beneficial to the merged department.
- To accommodate the AE faculty and staff in offices in Scott Lab, we expect to move some post docs, GRA, and nonteaching emeritus faculty members and visiting faculty members to Bolz Hall. Some of our faculty members object to having their students and post docs in another building. However, it is to be noted that faculty who have assigned research space which will accommodate graduate students in Scott Lab will not be affected by these moves. It will affect only people in "public" areas.
- Some people believe that our computer rooms and student facilities are now used to capacity. When the AE students come to Scott Lab, the ME students could be crowded and disadvantaged. We established a student merger committee with four students from AE and four students from ME, and this committee investigated the effect of the merger on the students. The computer crowding is more perception than reality. We have found that sufficient computers are available to cover the demands of ME, but the open computers are often in the west building. If nothing were changed, both the ME and AE students would be inconvenienced by the limited number of team rooms. However, we have found that much of this problem is due to the unrestricted availability of the rooms. As a result, non-engineering students use these rooms as study rooms or even lounges. We will eliminate this problem by installing key swipe systems which can be actuated by only ME and AE students. In addition, we will install computers in the team rooms which should address some of the concerns about the availability of computers.
- There are cultural differences in the two departments and some of the ME faculty members are concerned that the cultural differences will cause divisions in the ME faculty. They feel that it will reduce the overall high level of collegiality in the ME department. We believe that some of this feeling is based on past issues which are no longer relevant. The Merger Implementation Committee was successful in convincing most, but not all, of the faculty that this fear is groundless. Furthermore, it should be noted that the ME department successfully managed a merger with the Applied Mechanics Section about 10 years ago, and the lessons from that merger will be useful in helping this merger be successful.

- Some of the ME faculty members object to the name change to include Aerospace Engineering. They believe that this will reduce the prestige of Mechanical Engineering. It was pointed out to ME faculty that it was important to retain the visibility of aerospace engineering to the AE department's rather large external constituencies, specifically, potential students, companies and other organizations with aerospace engineering interests, and alumni. Most of the faculty members agreed with the logic for the name change, but a minority of the faculty members remained unconvinced.
- There were some concerns that Nuclear Engineering (NE) was not included in the name change. The response was that the department name is of most importance for undergraduate programs, and Nuclear Engineering has only a graduate program. In order to address these concerns as well as by way of follow-up of the PPAC recommendations on the Nuclear Engineering program, the college and the ME department have appointed a committee to look broadly at issues related to the Nuclear Engineering Program. We expect that, if NE does establish an undergraduate program in the future, the department will seriously consider another name change.

4. The total number of votes in ME is listed as 48 (page ix), yet elsewhere in the proposal the number of ME faculty is said to be 44 (page 3). This discrepancy should be checked and either corrected or explained.

Response:

According to the ME Pattern of Administration, all faculty members who have a fractional appointment in the department, research scientists, research faculty members, and clinical faculty members can vote on issues like the merger. In ME, the number of such eligible voters is 48, and this is the number to whom the merger ballot was sent. On Page 3 of the proposal, the number 44 refers to number of tenure-track faculty members who have at least a 50% appointment in ME. This is the number that would be reported in the program and department ranking surveys.

5. The budget information is vague, with a simple claim that the merger will be "revenue neutral" after an initial investment of about $295,000[2] for renovations to Scott Lab and the Gas Turbine Lab. Details about dollar amounts for revenue generated and costs incurred, in addition to the percentages over and under target budgets, should be provided for each of AE and ME. The Subcommittee believes that tables of before-and-after budget estimates should appear in the proposal.

Response:

The mechanical engineering department is under-budgeted based on the university's budget model, whereas the aerospace engineering department is over-budgeted. FY 09 budget figures are reported in Table 1 below for the two departments as well as the revenue sources and uses. Revenue sources include undergraduate and graduate student subsidies, tuition and fee income, indirect cost returns, and plant subsidy allocation. Uses include allocations for

[2] In the original proposal, the figure was $220,000. However, after meeting with the students, we determined that key-card swipe systems are needed for the team rooms in order to secure the rooms and to accommodate all of the students. In addition, recent estimates for upgrading the computer network at the Gas Turbine Lab on Case Road were considerably higher than our original estimates.

student services, research administration, and physical plant, and the central tax. Designated funds include distributions to departments for GRA and GTA fee authorizations, as well as distributions from IDC returns on industrially sponsored research, student technology fee income, summer enrollment income, and DDRS income. The target allocation refers to the budget position that would be indicated by the university's model. The data indicate that the merged department would continue to be under-budgeted but less so than the ME department is currently.

It is anticipated that, as the college moves toward re-aligning department base budgets to reflect the college's priorities as well as the university's budget model, additional resources would become available to the merged department as the college's fiscal position improves. Nevertheless, continuation of the under-budgeted position of the merged department under current conditions underscores the need for the merged department to be able to utilize resources that would become available with faculty/staff retirements and resignations if the anticipated benefits of the merger in terms of stronger mechanical and aerospace engineering programs are to be realized in the long term. The MOU between the mechanical engineering department and the college of engineering, attached in the appendix, addresses this issue. In brief, the resources arising from faculty/staff vacancies in the merged department over a period of three years following the merger will be available to the department for investment in the merged department.

Table 1: Fiscal situation in the individual and merged departments

	ME	**AE**	**Merged Dept. (MAE)**
Present			
FY 09 Revenue sources	$ 17.9 M	$ 2.7 M	
FY 09 Uses	$ 9.1 M	$ 1.8 M	
FY 09 Designated funds	$ 1.46 M	$ 218 K	
FY 09 PBA plus designated funds	$ 8.6 M	$ 2.1 M	
Target Allocation	$ 10.6 M	$ 1.1 M	
Budget Position (+ over, – under) funding	– 18 %	+ 94 %	
After merger			
PBA plus designated funds – FY 09 levels			$ 10.7 M
Target Allocation			$ 11.7 M
Budget Position (+ over, – under) funding			– 7.8%

6. CCAA requests that any Memoranda of Understanding among the affected faculty members and the Dean pertaining to the merger be included in the appendices of the proposal, with references to their existence incorporated at appropriate point(s) in the proposal.

Response:

A Memorandum of Understanding (MOU) will be included as an appendix to the merger proposal and mentioned appropriately within the proposal.

APPENDIX G

Response to Second Set of Questions from CCAA

Response to Second Set of Questions from CCAA on Merger of Mechanical Engineering and Aeronautical Engineering (Email dated October 20, 2009)

Response date: November 3, 2009)

Original Question:

1. The proposal makes only a tenuous argument relating the original rationale for the merger (to correct weaknesses in the PhD program in AAE that were claimed in the Graduate School's recent PhD program review) and the rationale given on page 4 (to combine resources to strengthen both departments). There are no proposed changes to the AAE PhD program. It would therefore be helpful to address the specific weaknesses in the AAE PhD program that were raised by the Graduate School review, and to explain directly how the merger would improve the AAE PhD program in these dimensions.

Original Response:

The rationale for the merger was discussed by the COE Performance Plan Acceleration Taskforce (PPAT) and by an initial Merger Study Group. Their reports are given in Appendices A and B, respectively, of the merger proposal. The PPAT Task Force identified two major issues that cannot be resolved without a major infusion of resources: a small size of research-active faculty and a small doctoral student population. In the foreseeable future, the COE will have insufficient resources to invest in AE unless it chooses to make significant cuts in the budgets of other productive departments.

Both of the issues noted above are addressed directly by the merger. As discussed in the proposal, ME has seven faculty members who do a significant amount of sponsored AE research, resulting in a step increase in the number of faculty involved in AE research, as perceived by the external peer community. Furthermore, in the merged department, they may be expected to supervise doctoral students in the AE program as there will be no real or perceived impediments for ME faculty to support AE students. In addition, the graduate courses in both AE and ME will be easier to populate in the merged department offering a wider choice of course options to the graduate students. This will increase the desirability of the AE graduate program. Therefore, there is likely to be an eventual increase in the number of AE graduate students. And finally, there are true and significant synergies between the two departments. We expect that both programs will become more efficient and visible because of the increased size, and this will be done without making significant changes to either program. Metrics for a successful merger will be an increase in rankings and funding, and we expect that both of these will show a significant improvement only a few years after approval of the merger.

Issue A

The committee felt that the answer to Question 1 was somewhat vague. It was not clear in the proposal or the response specifically what steps will be taken to increase the number of the AE faculty and PhD students once the merged department is established. Does the increase in AE faculty simply arise from the fact that current ME faculty with AE interests would be counted as AE faculty? Or are there plans to hire new AE faculty as positions become available? What is the critical mass of AE faculty within the merged department that is needed to support the degree programs? What is the plan to maintain/sustain this critical

mass? Have metrics been established that will indicate success (or failure) in the increase of faculty and PhD students?

Elaboration on Response:

In the climate of a constrained college budget that we are operating under, and the prospect of no growth in the size of the college faculty, there is no expectation that the merged department will grow in faculty size.

The strengthening of the doctoral AE program is expected to occur partly as a result of the synergies in the teaching and research interests of the faculty in the two departments, as noted in some detail in the Reorganization Proposal. These synergies will allow for courses at the graduate level to be combined where the overlap is strong, such as fluid dynamics, structures and vibrations, controls.

The benefits from the merger are expected to result partly from taking advantage of synergies between the two departments in their undergraduate and graduate programs. Graduate and elective courses with strong overlap may be combined and run with larger enrollments, allowing for some saving in faculty manpower which can be directed at developing other courses or more research.

The merger is also expected to improve the profile of the aerospace engineering program in the technical community. All of the seven faculty members in ME with aerospace engineering interests have active research programs and six of them have PhD students with many of the students performing aerospace engineering research. Initially, we expect that, following the merger, some of these faculty members will take on aerospace engineering MS and PhD students especially as domestic students are more likely to be available in that discipline. This will strengthen the AE graduate program but may do so initially at the expense of the ME graduate program. We do expect that the larger group of research-active faculty will result in better mentoring of the junior faculty and, in the longer term, a stronger AE graduate program. Our expectation is that the AE graduate program will benefit certainly in the short term from the merger, long term benefits depending on how junior (as well as other new) faculty with aerospace engineering interests function in the strong research climate of the merged department.

We recognize that, in order to continue to strengthen the aerospace engineering program, it is important to maintain and build upon the group of faculty members associated with aerospace engineering. As vacancies occur among the faculty associated with aerospace engineering and as replacement hires are authorized, the combined department will hire faculty members who also have primarily aerospace engineering interests. In addition, given the significant overlap between mechanical engineering and aerospace engineering, it is likely that some new faculty members hired at other times will have interests in areas that will strengthen the aerospace engineering program.

Issue B

Regarding the MOU, the committee also found some of wording to be somewhat vague. Under Personnel, Item 2 the use of PBA returned to MAE is discussed and it is stated that "MAE will reinvest these resources to realize the anticipated benefits of the merger in terms of stronger MEC and AE programs." It is not clear what this means. The MOU does not discuss specific faculty slots to expand the AE faculty or maintain a critical mass of AE

faculty within the merged department. The committee realizes that the MOU should not be overly restrictive, but is there a danger that this flexibility may in fact threaten the future of the AE academic programs within the merged department? Finally, the MOU mentions the use of PBA "for the administrative leadership of the Center for Propulsion." There is no mention of this center in the merger proposal. The committee requests additional information on this center and its potential impact on the merger. For example, will this result in an additional faculty position for AE?

Response

As noted above, the objective of the merger is to ensure that stronger MEC and AE programs result. Given the overlap in the two disciplines, we anticipate that this could be achieved by looking particularly carefully at faculty candidates who would contribute strongly to both programs, when opportunities for faculty hiring arise. We appreciate the committee's concern for the future of the AE program, and assure the committee of our own sensitivity to this issue. For this reason, these concerns were discussed thoroughly as part of the process that resulted in the Reorganization Proposal, and resulted in significant changes to the governance of the merged department to protect the aerospace engineering program.

The Center for Propulsion is intended to advance aeropropulsion research in the college. No new faculty positions are anticipated for the Center as a result of the merger. However, the Center for Propulsion is being created to advance aerospace research in the college, and faculty members from the merged department are expected to participate in the Center and to promote its growth. Therefore, the MOU language ensures that resources for the center leadership will be preserved by the merger and will continue to be available in the future.