GRADUATE COUNCIL MEETING  
June 1, 2006  
3:00pm, MU 212

Present: Koenig (chair), Filtz, Francis, Gitelman, McLain, Proebsting, Rettig, Rockey, Sanchez, Tadepalli, and Unsworth

Absent: Harter, McCandless, McMullen

Guests: Tom Adams, Steve Hobbs, Ron Adams, Jose Reyes

1. Minutes from Previous Meeting

A motion was made and seconded to approve the minutes of May 4, 2006. All voted in favor. Motion passed.

A motion was made and seconded to approve the minutes of May 18, 2006. All voted in favor. Motion passed.

2. Forest Science Graduate Program Review Report

Prasad Tadepalli (Electrical Engineering and Computer Science) presented the report of the Forest Science Graduate Council Program Review Committee to the Graduate Council. The review’s site visit took place April 10, 2006.

Tadepalli prefaced his presentation by saying that the review panel found the Forest Science self-study to be very detailed and useful and that although they were also presented with a draft report of the OSU College of Forestry Survey prepared by the Committee on Academic Freedom and Responsibility, the review panel decided not to utilize that analysis because it was based on input from all the departments in the college, not just Forest Science. Tadepalli added that the Forest Science program is reputed to be one of the best in the country with research output beyond what one would expect for its size. The review panel feels that it is important for OSU to maintain its leadership in forestry by fully supporting the Forest Science Department and strengthening its graduate program.

Tadepalli presented the Council with the Review Panel’s major recommendations:

- Develop a vision and strategic plan for a fiscally viable department. Make sure that the strategic plan of the department is well-aligned with the university strategic plan.
- Examine the needs of the curriculum for the graduate students and collaborate with the other related departments and colleges in the university to develop a strong curriculum of cross-listed courses that serves the needs of Forest Science and related departments on campus. Collectively convince the administration to commit to faculty resources to cover these classes on a regular basis.
• Develop creative ways to collaborate with other universities through distance learning and other means to give the students a broader research and educational experience.
• Increase the production of graduate students to be in line with the faculty size and the research funding.
• Try to find support for a controlled environmental growth facility capitalizing on existing and new funding opportunities.

In response to the recent events surrounding the attempt by some college faculty to delay the publication of the article in Science by Donato et al, the review panel also made the following recommendations:

• Implement a diversity plan including a strong preference for hiring external candidates.
• Hiring internal candidates should be rare and should only be allowed in exceptional cases. Ensure that the faculty searches are not narrowly focused. Hiring committees should be diverse, transparent and open to input from all faculty at all stages of the process.
• The Department and the College should encourage communication between faculty and students of different stripes by supporting cross-departmental projects, and by sponsoring a colloquium or mini-symposium on controversial issues. Train the students in critiquing each others’ ideas and responding to criticisms in a professional way.
• Work with other departments in COF to develop an expansive, forward-looking vision of forests as a whole that includes all aspects of forestry. Promote this broader vision among the faculty, the students, the administration, and other stake-holders.

The review panel made the following recommendations in regard to the Forest Science research program:

• Develop a vision and strategic plan for the research program in the department. Integrate it with an overall plan for the teaching, extension, and research mission.
• Increase the graduate student production especially at the Ph.D. level to raise the stature of the department and its long-term impact.
• Develop a communication strategy for use with clients and stakeholders to articulate the research vision.
• Increase the effectiveness in transferring the scientific information produced in the research program to potential users (strengthen the relationship between research, teaching, and extension).
• Add expertise in soil science.
The review panel made the following recommendations to improve and strengthen the FS community:

- There should be a continued commitment to forests as a whole, leading to an expansive, forward-looking vision of forestry. The two camps of the forest science must be bridged by pursuing the common ground between the production-oriented research and the ecological and biological research.

- Faculty searches must be focused broadly and should seek the strongest possible candidates regardless of cultural, regional, or even forestry background.

- The department must implement a diversity plan that includes a strong preference for external candidates. The faculty search process should be reformed so that the search committee acts on behalf of the faculty to conduct a broad search, then summarize and prioritize the applications. The faculty as a whole reach consensus 1) on the candidates to interview and 2) the final recommendation.

- Cross-departmental communication should be facilitated by encouraging group research projects with multiple PIs, and by having a college-wide colloquium or annual mini-symposium to exchange and debate research and views within COF and FS.

To view review panel recommendations on department facilities, program curriculum, and graduate students, please refer to the full report.

Hal Koenig (College of Business) then gave Tom Adams (Forest Science) an opportunity to comment.

Adams thanked the Council and the review panel members in particular for their efforts on the review. He said that the panel members were conscientious, that the report was very thorough, and that in general the panel did a very nice job. He admitted that the report offered a lot of good ideas and that a number of its recommendations were “spot on,” although he naturally could not agree with all of them.

Adams also told the Council that he believed that the program review process, although a tremendous amount of work, is a great opportunity for self-learning for all departments. He said that the review panel’s report will set the stage for a lot of thinking within Forest Science and the college as they work towards tackling some of these issues.

Steve Hobbs (College of Forestry) was then asked to comment. He thanked the review panel for its constructive critique of the program. He said that the report will add fuel for the department and college to deal with some of these very pressing issues. He understands that the issue of declining faculty in the area of soil science has been a serious concern, but it is difficult to find the permanent FTE to fund these critical areas. He added that the problem of losing key faculty areas is campus-wide.
When asked for questions or comments, Michael Unsworth (Atmospheric & Oceanic Sciences), asked if the department or college had any thoughts or solutions on how to build or maintain its number of graduate students, when one finds that it is more efficient to get the research done by hiring research associates. Unsworth asked if Adams had found other ways to fund graduate students, especially during the early years when graduate students are very busy with coursework.

Adams answered that for twenty years the department has received no funding from the university or college to fund graduate students aside from the funding received from contracts or grants. He added that it is no accident that Forest Science is as effective a research unit as it is. Employing research assistants/associates to do the research is one of the reasons for the success, but Adams admits that they are losing students. Adams reported on a suggestion made by Steve Radosevich to revitalize the Master of Forestry program. An MF program would increase the number of self-supporting students. In regard to enlarging the PhD population, Adams stated that it is up to the faculty to decide to fund students rather than research assistants but he wonders if the faculty would be willing to risk a reduction in research productivity. Adams said that another strategy discussed within the department would be to attract more students to the master’s and certificate programs in sustainable natural resources.

Koenig questioned the use of the word “university” in a statement made on page six of the report criticizing OSU for its lack of a global reputation in Forestry. Tadepalli explained what reviewer John Laurence meant by the statement and admitted that the word “university” should probably be changed to “college” but that he would confirm that with the other review panel members. At Koenig’s request, Adams explained that applied FS research is almost strictly regional in scope while the basic research (in forest ecology) has no boundaries.

Sally Francis asked Tadepalli what was meant by a comment on page 12 of the report. She said that the Graduate School has never provided graduate student targets. Her preference would be for Tadepalli to remove the statement. Tadepalli said that he would consult the review panel.

Adams and Hobbes left the meeting.

Unsworth then asked Tadepalli to what extent he felt that having external reviewers without US university backgrounds effected negatively their contribution to the team. The reviewers, Tadepalli answered, were very strong in their fields and that the only minor issues that arose were of an administrative type. William Proebsting (Horticulture) added that the external reviewers understood the forestry system very well. He said that they were insightful and contributed a great deal.

A motion was made and seconded to approve the report subject to the revisions requested by the Council with the understanding that Koenig would provide Tadepalli oversight in assuring that the revisions meet Council’s requirements.
All voted in favor. Motion passed.

3. Old Business

Unsworth and Theresa Filtz (Pharmacy) then gave the Council a brief update on their committee’s work writing a “Responsible Conduct of Research” training grant proposal.


Theresa Filtz (Pharmacy) presented the report of the Nuclear Engineering/Radiation Health Physics Graduate Council Program Review Committee to the Graduate Council. The review took place February 13, 2006.

Filtz began by saying that the overarching feeling of the review team was that Nuclear Engineering/Radiation Health Physics is a very successful and impressive graduate program. The team’s recommendations are not meant as criticism but if followed could serve to strengthen an already strong program.

Filtz then presented the Council with an overview of the Review Panel’s recommendations:

- Faculty are overburdened and will not be able to meet the rapidly increasing demand for the more graduates without a serious investment by the College and University. As top ranked programs among only a handful of similar programs nationwide, NE and RHP are great assets to the College and University. The graduate programs risk losing national stature due to staffing challenges and/or becoming overly dependent on unstable external funding. We recommend an increase in full-time, tenure-track faculty.

  Filtz told the Council that the primary recommendation (above) was driven by the external reviewers who were stunned by the workload carried by NE/RHP faculty. This sentiment was also felt by the internal reviewers but they were not as surprised, as they are more aware of the budget situation at OSU.

- Faculty need to find a mechanism to reduce teaching loads to compensate for high productivity in research and obtaining research funding. This recommendation was made in 1991 and remains unaddressed.

- Faculty need to re-evaluate the under-utilization of graduate teaching assistants as a means to reduce the undergraduate teaching load.

- Demand for graduates is high and expected to increase dramatically in the near future. Overall graduate student quality is very good; however, an equal number of equally qualified applicants are not admitted due limitations based on funding, faculty size and research interests. The college and department need to consider means to expand the
program to take advantage of increased demand for graduates and adequate supply of qualified applicants.

- Faculty are encouraged to participate in on-going graduate programmatic assessment based on academic goals. Faculty productivity in terms of revenue generation appears to be over-emphasized relative to publication quality. Collection of data on graduate applicants and admittants should be on-going.

- Require all graduate students to complete at least one application annually for external funding. The department should offer to cover the expenses of application submission, including costs of requests for official transcripts.

- Reverse the downward trend in the number of scheduled seminars. Do not schedule more than one seminar at any one time.

- Consider offering special seminars or colloquia centered on ethical issues specifically for graduate students.

- The department deserves commendation for an exceptionally detailed and very useful graduate student handbook.

- Find innovative ways to offer more stand alone graduate courses at the 500/600 levels.

- Faculty should proceed cautiously with the plan for a new joint-degree program in Medical Physics in collaboration with OHSU.

  Filtz reported that the review panel members did not want to see the medical health physics program expand at the cost of the radiation health physics program as the RHP program is only one of six in the country and of national importance.

- The reactor, APEX facility, radiation center, and radiochemistry lab are exceptional facilities. However, they appear to be significantly influenced by funding sources and could be better integrated with the academic mission.

- Better integrate the research of the NE and RHP disciplines with each other and with the strengths of the department and University in environmental measurement and assessment.

- Develop and integrate a department-level diversity action plan with the College of Engineering’s plan to increase diverse gender and ethnic representation among graduate students, faculty and staff.

After the presentation, Jose Reyes (Nuclear Engineering) thanked Filtz and said that the report was very thorough, insightful and very helpful. He reported that his unit is already working toward following the recommendations.
Reyes updated Filtz and the Council on recent discussions with OHSU regarding the design of the proposed medical physics program. Although the original idea was to design a professional program, an MS and PhD program is also being considered.

Ron Adams (College of Engineering) made one comment on the faculty load issue. He told the Council that this is a major issue across the College. He informed the Council that the College has made a proposal to the Technology and Industry Council for funding. He hopes that the State Board of Education can also be pressured to help out. Adams added that he is proud of the faculty’s research productivity despite the heavy teaching work load. Adams added that NE/RHP is the highest ranked engineering program in the College.

Koenig then asked if the Council had any questions for Filtz or the visitors.

Dan Rockey asked Reyes if faculty load will be impacted with the addition of the medical physics program. Reyes responded that the department is already teaching most of the medical physics courses under radiation physics. Since there is a lot of coursework overlap between the two fields, the department will not need to hire a lot of new faculty.

Tom McLain questioned the educational benefit of requiring all NE/RHP graduate students to complete an annual application for external funding. Filtz responded that it was actually the graduate students themselves who suggested this recommendation during their site visit interview. It was thought that this requirement would provide a good opportunity to improve grant writing skills and if a student is successful in securing external support he/she could return his/her GTA/RA award to the department for reassignment.

Reyes and Adams left the meeting.

A point of clarification was asked regarding NE/RHP teaching workload.

Filtz explained then assured the Council that during the site visit the NE/RHP faculty never complained about their workload but instead displayed pride that they could handle it. She added that the graduate students also had very high morale and that the department was a strongly collegial one.

A motion was made and seconded to approve the review report as submitted. All voted in favor. Motion passed.

5. New Business

As this is the final meeting of the year, Sally Francis (Graduate School) and Koenig took a moment to thank everyone for serving as Graduate Council members this year.

Francis announced the winner of the new graduate faculty mentor award (Excellence in Graduate Mentoring Award). Peter J. Bottomley was selected. Francis said that the
response to the call was fantastic with 14 strong nominees. Dr. Bottomley’s achievement will be recognized at University Day and at a Graduate Council meeting in the fall.

Meeting adjourned.
Review of the Graduate Program in Forest Science

1. Introduction

The Graduate Council conducted a review of the Department of Forest Science as part of the regular cycle of graduate program reviews at Oregon State University. The review took place simultaneously with the review with the USDA CSREES Research Program review. The review team members were as follows:

Oregon State University Members
Prasad Tadepalli, Electrical Engineering and Computer Science (Chair)
William Proebsting, Horticulture

External Review members
John Laurence, Pacific Northwest Research Station
Cindy Prescott, University of British Columbia

Additional CSREES Review Team Members
Catalino Blanche, CSREES (Team Leader)
Lee Allen, North Carolina State University
Joseph McNeel, West Virginia University
Anna Sala, University of Montana

Sally Francis and Bruce Rettig, the Dean and the Associate Dean of the Graduate School, also attended parts of the program review. The department prepared a detailed self-study report before the review, which was sent to the review team on the 28'th of March. The review team had a pre-review meeting on the night of April 9'th with Dean Francis, who discussed the review process and the format of the report. The review team visited the Department on April 10'th. The review schedule is attached in the Appendix.

We had also seen a draft report of OSU College of Forestry survey done by the Committee on Academic Freedom and Responsibility, chaired by Norm Johnson. After some deliberation, we decided to not use this survey in our report because it was based on the input from the entire college and is going to be dealt with by Johnson’s committee. We also solicited email comments from the forest science faculty on the administration and the culture of the department, to which a couple of the faculty responded. This review report was written by the following four members of the review team: Prasad Tadepalli, John Laurence, Cindy Prescott, and William Proebsting.

2. Executive Summary

The Department of Forest Science at Oregon State University is reputed to be one of the best in the country and occupies a unique position in the College of Forestry. The department is a research leader in the university and has many accomplished faculty members. The faculty, research staff, and the graduate students conduct world-class research. The productivity of the department in terms of the research papers and their impact is well-above their peer institutions. The graduate students are well-supported by grants and have high regard for their advisors. The research funding of the department has been among the top three departments at OSU. The core curriculum on posing relevant research questions and using appropriate research methodology
for answering them is unique and innovative. The statistical advising freely made available to the students received high praise from the committee. It is important for OSU to maintain its leadership in forestry by fully supporting the Forest Science Department and strengthening its graduate program.

In spite of the above strengths in research and teaching and the excellent reputation and accomplishments of its faculty, the department and the graduate program face some important issues that deserve immediate attention from the department and the college. Some of these issues are related to fiscal matters and some are administrative and cultural. We deal with them separately. The professorial faculty of the department fell by 22% in the last 5 years. The annual expenditures of the college exceed the revenues by 30% and threaten its future fiscal health. The department lost critical strengths in important areas such as soil science and forest mycology and lacks a clear department-wide research strategy for the future. It heavily depends on the support staff, i.e., faculty research assistants and associates for their research. The department does not have a large enough graduate student body relative to its faculty size, especially given that the faculty does not have undergraduate teaching responsibilities. The graduate students complain of not having access to a sufficient number of graduate courses both within and outside the department. We list the major recommendations here leaving more detailed recommendations for the remaining sections.

- Develop a vision and strategic plan for a fiscally viable department. Make sure that the strategic plan of the department is well-aligned with the university strategic plan.
- Examine the needs of the curriculum for the graduate students and collaborate with the other related departments and colleges in the university to develop a strong curriculum of cross-listed courses that serves the needs of Forest Science and related departments on campus. Collectively convince the administration to commit to faculty resources to cover these classes on a regular basis.
- Develop creative ways to collaborate with other universities through distance learning and other means to give the students a broader research and educational experience.
- Increase the production of graduate students to be in line with the faculty size and the research funding.
- Try to find support for a controlled environmental growth facility capitalizing on existing and new funding opportunities.

Many of the issues related to the administration and culture have come to light with the recent unfortunate events surrounding the attempt by some college faculty to delay the publication of the article in Science by Donato et al on effects of post-fire logging. Although this incident is regrettable, it sheds some light on the underlying problems of communication and culture within the department and the college. Some graduate students, faculty, and administrators are concerned by the apparent lack of collegiality and communication between faculty members of different groups. There is little diversity among the faculty members in race and gender. Perhaps more importantly, more than half of the current professorial faculty in the department earned their Ph.Ds at OSU. From the remarks of some of the faculty, the hiring practices encourage inbreeding by not being sufficiently open and transparent. It is important to take immediate steps to address these issues in a precipitous and transparent fashion. We recommend the following actions:

- Implement a diversity plan including a strong preference for hiring external candidates.
Hiring internal candidates should be rare and should only be allowed in exceptional cases. Ensure that the faculty searches are not narrowly focused. Hiring committees should be diverse, transparent and open to input from all faculty at all stages of the process.

- The Department and the College should encourage communication between faculty and students of different stripes by supporting cross-departmental projects, and by sponsoring a colloquium or mini-symposium on controversial issues. Train the students in critiquing each others’ ideas and responding to criticisms in a professional way.
- Work with other departments in COF to develop an expansive, forward-looking vision of forests as a whole that includes all aspects of forestry. Promote this broader vision among the faculty, the students, the administration, and other stake-holders.

3. Overview of the Department

The Department of Forest Science is one of four departments in the College of Forestry. The origins of the College of Forestry at OSU go back to the state-funded forestry research program in 1940 in Salem. The group moved to Corvallis in 1957 and gradually became part of OSU. In 1967 it merged with the other forestry faculty on campus, and the Forest Science Department was formed as a separate unit in 1976. Currently the department has 19 tenure track faculty and 59 graduate students. It also has 4 fixed term faculty, 5 active emeritus faculty, and a large body of adjunct and affiliate faculty who also supervise students.

The mission of the Department of Forest Science is “to provide strong research programs in education and research with the goals of furthering knowledge; training future scientists, teachers, and practitioners; informing the public; and, helping society deal effectively with the pressing issues of forest health, productivity, conservation, and sustainability” [Self-study, pg 6].

The department’s research is well-aligned with its mission statement and includes a broad spectrum of activities that deal with understanding of forest growth, function, and change with the multiple goals of improving forest health, productivity, conservation, and sustainability. The education mission of the department includes developing expertise in several areas related to the above goals including forest ecology, genetics, biotechnology, tree physiology, integrated forest protection, silviculture, agro-forestry, and sustainable forestry.

The department’s primary emphasis is on research with most faculty having 0.15 FTE or less devoted to teaching. The department is a research leader in forestry. Its faculty is world-renowned and brought over $36 million dollars in research in the past 4 years, over 50% of which is through competitive grants. The comparisons in the self-study document show that the faculty’s publication and citation records are the best among their peers. Forest Science has been consistently among the top 3 departments at OSU in total grants and contracts awarded each year. The department offers Master of Science, Master of Forestry, and doctorate degrees. Almost all the students are supported through GRAs and fellowships and seem to receive high quality advising, teaching, and research experience.

In spite of these positive factors, there are a few troubling aspects that need attention. Like all other departments at OSU, Forest Science was also subjected to dwindling state support. As a
result, its faculty is smaller today than 5 years ago by 22% and the graduate student body is smaller by 32%. It is estimated that the college’s annual expenditures exceed its revenues by 30% and without changes in resources or expenditures, the College reserves will be exhausted by 2010. The department lacks a strategic plan to cope with the dwindling resource base and appears to be looking for a direction. Currently the faculty is undecided about issues such as breadth vs depth in its research, how to increase revenues and find new sources of funding, what research areas are most attractive, appropriate proportions of production vs. ecological research, and the relative importance of graduate student training vs. post-doctoral research staff.

Related to the above item is the disappearance of many vital subject matter graduate courses both in the department and across the campus. Examples include plant physiology and soil science. Lack of adequate graduate courses is one item that is brought up by the students in surveys and personal interviews as the most pressing need they feel. While some faculty members found creative solutions to the problem, such as sending their students to other universities, this approach seems expensive in the long-run.

Last but not least, the department has recently suffered a serious blow to its prestige arising out of the attempt by some faculty in the college to delay the publication of an article in Science authored by two graduate students and their faculty mentors (Donato et al) on the effects of post-fire logging. This raised some questions about the communication and collegiality of the faculty members of the college, and whether the administration is taking sides that might impinge on the academic freedom of some students and faculty. The dean has appointed a special committee to look into this and make recommendations. We address some of the systemic issues that were raised by this incident in Section 8 of this report.

4. Faculty Research

The Forest Science department at Oregon State University is home to an impressive research program that is both large and complex. To a great extent, the program provides an adequate mix of research that addresses issues of regional, continental, and global importance. In addition, there is a substantial effort to build and maintain long-term, collaborative research programs (e.g., CFER, AmeriFlux, and Andrews LTER) while still addressing shorter term regional needs through Cooperatives. The faculty has also forged strong relationships with federal cooperators and the result is a research partnership that substantially increases the capacity of the Department. While commendable, it was not necessarily clear to either the review team or to clients that this strategy or outcome is intentional or even appreciated. Nor was it clear whether the research program is integrated with a strategic vision for the Department.

Research in the Department is almost entirely dependent upon external sources of funding that are increasingly difficult to obtain and are likely to decrease in magnitude. The faculty is very successful in competing for these funds and the number and quality of scholarly publications (as determined by the journals of publication) is outstanding. They meet or exceed the level and quality reported by peer institutions. Outstanding productivity is further evidenced by the continued and even increased success at acquiring competitive funding. Given the level of support from the University and from the State, substantial external funding will remain essential to the continued operations of the Department, thus the need to plan strategically is critical. The
Department faculty should consult with research partners and other funding agencies to assure that they understand future priorities.

The faculty members receive substantial national and some international recognition for their efforts, particularly as evidenced by invitations to participate in meetings. They also frequently serve the scientific and professional communities through participation in committees, on grant review panels and editorial boards. There are a few instances of awards of international and national stature, however most awards are given at the regional or University level.

Another measure of the quality of the research program is the success of students in gaining appropriate employment after they leave the university. Information was presented on the current employment of about 50 percent of the graduates from the past 10 years. By-in-large, the Forest Science graduates who were tracked have been successful in obtaining professional positions that relate to their area of study. The positions of the remaining half of the population are unknown. Future study/employment should be tracked more carefully in the future.

Many faculty members have adopted a model for research that depends more on fixed-term positions rather than relying on graduate students to maintain their research productivity. While the number of graduate students per active faculty member varies, it averages less than 3. Departments of comparable size in other universities have larger numbers of graduate students. For example, the University of British Columbia has more than 4 students per faculty on average, although all faculty members there have significant undergraduate teaching responsibilities as well. Given the amount of research funding the faculty attracts and given that they do not have undergraduate teaching responsibilities, the department should be producing more graduate students.

**Strengths**

- The faculty members are highly regarded, and highly productive with several members producing contributions to the scientific literature in numbers and quality far above the academic norm.
- The research enterprise provides an excellent opportunity to train graduate students at all levels and to further the experience of post-doctoral scientists.
- The members of the department publish their work in high quality outlets, appropriate to the subject matter.
- There is a good balance between research that addresses regional, continental, and global issues in forest science.
- The Department maintains an appropriate mix of applied and basic as well as short and long-term research. Of particular note are the HJ Andrews program, the CFER program, and the research cooperatives, each a long-term effort addressing a different client base.
- There is a large extended faculty who provide excellent supervision, mentoring, and broad expertise to students.

**Weaknesses**

- Research projects by individual faculty members driven by short-term funding opportunities leads to a perception that the Department lacks a long-term strategic vision of its research.
• The Department has not made it clear to clients what the research program is and why it is what it is.
• Actual transfer of technology lags substantially from initial publication
• The College has not successfully established OSU and COF as internationally important research entities in the minds of the constituents. There are important ramifications of leaving the ranks of regionally focused universities and joining those that have a more global focus.
• The number of graduate students is low relative to number of extended faculty and grant support.
• One specific and critical area of research needs to be addressed: with retirements and relocations, there is no expertise in forest soil science in the College. Given the potential role of nutrient cycling and below-ground processes as an integrating discipline, it is critical to add this expertise to the faculty.

Recommendations

• Develop a vision and strategic plan for the research program in the department. Integrate it with an overall plan for the teaching, extension, and research mission.
• Increase the graduate student production especially at the Ph.D. level to raise the stature of the department and its long-term impact.
• Develop a communication strategy for use with clients and stakeholders to articulate the research vision.
• Increase the effectiveness in transferring the scientific information produced in the research program to potential users (strengthen the relationship between research, teaching, and extension).
• Add expertise in soil science.

5. Facilities

The facilities available to the Forest Science department appear to be adequate to meet the mission and needs of the unit. Space is becoming limiting however and if the size of the Department increases, it will become increasingly important to optimize the use of facilities. Offices, laboratories, seminar rooms, and common areas available in Richardson Hall are superb. While the entire department is not housed in a single building, the availability of space in the FSL provides similar quality facilities in an adjacent building. Also, given the active participation of several courtesy faculty from the Forest Service and USGS, it seems unlikely that graduate student research would ever be accommodated in one location.

There is some concern about the availability of state-of-the-art greenhouse space. A new facility at Oak Creek, originally constructed for other purposes, is being modified to provide additional research greenhouse space, however, it was not clear whether this space will be available or appropriate for other Departmental uses. Its location makes it inconvenient, but there does not appear to be sufficient vacant space near Richardson Hall to alleviate the problem.

The Department is lacking a controlled environment growth facility and it would likely be put to immediate use were it available. The Department should consider seeking foundation
funds (e.g. NSF, Kresge, Ford, Rockefeller, others) to support the development of such a facility.

There is substantial use of laboratory space for storage, however, much of that seems to be used for storing and maintaining expensive instrumentation that is deployed during the field season. Thus, it may not be feasible to store equipment elsewhere. In addition, there did not seem to be a concern about a shortage of laboratory space.

Computer support and the availability of the QSG for statistical consulting are services that earned the envy of the committee members. The Department and College should do everything possible to maintain this exceptional level of service.

Strengths

- Richardson Hall provides superb office and laboratory space.
- There is excellent computer support via the FCR.
- The new containment facility for insect and pathogen work is an important new addition.
- The HJ Andrews and College forests provide outstanding field research opportunities.
- The Cooperative Chemical Analytical Laboratory (CCAL) provides excellent analytical support for a number of research programs.

Weaknesses

- The Department is not housed in one building, however, given the close collaborations with courtesy faculty at CFSL it is unlikely the Department could be consolidated in one location.
- Tree growth facilities are very limited (e.g. general purpose greenhouse and controlled growth chambers). The Oak Creek greenhouse may or may not alleviate the problem at the Department level.

Recommendations

- Optimize the use of existing space. Examples of space optimization are: 1) relocation of storage material (samples; old archives) and non technical field equipment (ladders, tools, etc.) in low quality space to free up high quality space for laboratories and offices; 2) grouping graduate students in larger multiuse offices.
- In the event of the construction of a new building, consider possibilities for a physical linkage with Richardson Hall.
- Capitalize on existing funding opportunities (e.g. USD-NRI, foundations, and NSF) for equipment and research infrastructure.

6. Graduate Program and Curriculum

The Department offers Master of Science, Master of Forestry, and the doctorate degrees but no undergraduate degree.
The department embarked on a curriculum revision effort six years ago, so they are three years into the new curriculum and mentioned that this was a good time to reflect on it. The curriculum is in keeping with their stated mandate of training scientists. The core curriculum (FS520 and FS521) is innovative serving many purposes including teaching the skills to develop a research proposal, introducing students to related fields and other professors, and fostering cohesion of students from different research groups early in their program. In the fall, the students are required to take two 1-credit modules in addition to the 1-credit FS520 on “posing researchable questions.” In the winter term students take FS521, which is a 2-credit course on “developing a research plan.” In addition, they try to offer 1-credit companion modules that emphasize specific research skills, but these are not required. The department sometimes had difficulty in finding faculty to offer these optional modules.

The curriculum review revealed that potential employers of graduates ranked communication skills as the highest priority for graduates. The department has opted to not have a separate communication skills course, preferring to limit the number of mandatory (hoop-jumping) courses. This may be symptomatic of the professoriate being perhaps too influenced by students’ immediate attitudes and reflexes regarding being told what to do, rather than serving their long-term interests. The curriculum revision plan identified a number of potential workshops that could be offered by FRL staff which would provide excellent communication training for students. It is not clear if this has happened. The department has opted to have students to develop their communication skills within existing Forest Science graduate courses and in lab group meetings and students confirmed that they were indeed part of graduate courses, but the department needs to reflect on whether this is sufficient given the importance of these skills in graduates who become scientists and natural resource professionals. The communication skills may be expanded to include media communication, especially for those students engaged in policy-relevant research.

The graduate students pointed to a lack of courses available to them to meet their graduate program requirements as the key curriculum issue. Of lesser note was a concern that they had to go outside the department for many courses. It would not be recommended that similar courses be taught in different units within the same university, so this is not a “real” problem. The issue may instead be to what extent and for how long other units are happy to teach Forest Science graduate students, and if the department is seen and will continue to be seen as pulling its weight in terms of course offerings for graduate students (could see this being a real issue if faculty in other units are teaching Forest Science students, in addition to large undergraduate teaching loads in their own unit). The department will clearly have to maintain a good suite of courses available to students in other units to maintain this positive relationship on campus.

More significant were areas identified in which “service” courses were no longer available anywhere on campus. Examples were plant physiology and (perhaps) genetics. In the words of one student who is surveyed in the self-study (vol II page 84):

“The lack of course offerings that are stand-alone graduate courses severely limits the major and course work a student is able to take. I will have 3 credits from Forest Science (not including thesis) when I graduate and I am a FS graduate student??? I do not think there are adequate plant physiology courses available within or outside of this department. Barbara Bond’s course is one of two courses in plant physiology left at the graduate level and that raises serious concern in my
mind. I contemplated leaving OSU and finding a university with better course offering so that I could have the basic information required to complete my degree.”

It was clear that department members (Bond and Howe in particular) had shown leadership in resolving these problems, but the process had broken down, apparently when it came time for units to commit resources to teaching such courses. It is not clear if only graduate courses in this area are lacking, or if undergraduate courses are also unavailable – if the latter, then a fix is needed regardless of declining resources. The department may have to be innovative in this regard, perhaps partnering with other universities that have maintained plant physiologists, to offer senior undergraduate and/or graduate courses through video conferencing or such technologies. Modular specialized courses were mentioned – this may be what the department needs to explore in order to maintain graduate course offerings across all disciplines in the face of a shrinking professoriate. The most worrisome gap in courses is in the discipline of soil science, which, prior to recent retirements, was one of the disciplines for which OSU was world-renowned. Restoring capacity in soil science should be a high priority for the department, college and university.

The most troublesome challenges faced by students on curriculum issues have resulted from well intentioned policies in the Graduate School and elsewhere in the university administration. A new policy stating that half of each student’s credits must come from graduate courses and not “split-level” senior undergraduate/graduate courses, has compounded the problem of the lack of courses offered at any time that are useful and appropriate for graduate students.

Faculty members have responded to students concerns about lack of teaching experience during their graduate degree by developing a graduate course in which students develop a syllabus for a course. This is well intentioned but may not really solve the problem, which may not be a solvable problem within a graduate degree. Forest Science graduates do not get opportunities to serve as TAs, and so worry that they are not getting the ‘teaching experience’ that students in other departments enjoy. This is probably more of a perceived problem than a real one, as most TAs do not get much teaching experience or mentoring, and most would probably prefer to be GRAs as Forest Science students are, if they had the option. Another point raised by one person in our interviews is that most professors never actually learned how to teach and so should probably not be offering such courses. This may be an opportunity for the Department of Forest Science to show leadership in this important area by developing modules with the Education Department on university-level instruction for graduate students. The Graduate School might be the logical champion of such a module or course, “Teaching in Academia,” for all graduate students on campus as part of a Graduate Professional Development initiative. Students could also be proactive by approaching faculty who do teach and requesting an opportunity to teach in their course and some guidance from the instructor about their teaching. Persons from the RA pool who took this initiative found the instructors to be receptive to this and gained valuable experience. Faculty could facilitate this by making the necessary contacts for students who express the desire to get some volunteer teaching experience.

The department, like many other institutions, needs to keep the listing of graduate courses in the Catalogue and the Graduate Handbook up to date. There are several courses in the catalogue that are not offered in the last 3 years. These should be removed. Students need to know before they arrive on campus which courses are offered so they are not unpleasantly surprised when they arrive on campus to find that many of the courses that they expected to take are no longer
offered. The committee had some difficulty discerning which courses are currently offered, so it is likely that students also have difficulty.

Strengths

- Breadth in program – areas of interest
- Lots of flexibility in course selection
- Innovative core sequence course
- Availability of statistical advising

Weaknesses and Recommendations

- Loss of campus-wide service courses
  - Lead a campus-wide effort to coordinate and streamline the different biology curriculums in different departments and get administrative support for offering these courses on a regular basis.
  - Develop a strong set of stand-alone graduate courses covering the broad spectrum of forest science. Get administration’s commitment to increase the teaching FTE to an adequate level to be able to offer these courses.
  - Explore creative solutions such as modules, short courses, video-conference courses with other universities
- Minimum enrollment policy discourages faculty from offering graduate courses
  - Advertise courses across campus
- No course in fire ecology
  - Coordinate with Forest Resources
- No soil science courses
  - Restoring soil science teaching and research should be top priority
- Limited teaching experience opportunities for grad students
  - Encourage/ facilitate students to seek volunteer teaching experiences
  - Explore partnering with Education to develop science education course
- Coordinated approach to improving communication skills
  - Mandatory communication workshops or core course

7. Graduate Students

The department has been successful in attracting bright, motivated graduate students and appears by all accounts to take good care of the students in all aspects of their graduate program. Currently there are 59 graduate students in the program, out of which 24 are Ph.D. The administration of the graduate program by department staff received consistent praise. The graduate students who talked with the panel expressed few concerns about their graduate program, other than insufficient graduate courses and the issue of collegiality among faculty, which will be addressed separately.

The graduate students cite the reputation of the college and the faculty as the main reasons for choosing OSU. Currently 96% of the students receive support at 0.49 FTE and the remaining receive support at 0.2 FTE. Most of the students are supported through GRAs. The department has an active scholarship committee that is quite effective in obtaining fellowships for its
students. Although the funding policy is officially for 2 and 3 years respectively for MS and PhD students, most students take longer than this time to complete, but are funded through completion of their thesis. Occasional cases of funding lapse have been dealt with by the department to ensure that students do not find themselves without a stipend while within the expected time-in-program limits. The number of graduate students (“carrying capacity”) of the department is thus set by the number of faculty and their ability to secure research funding, which is exemplary.

There were no concerns raised about any faculty members taking on more students than they can properly supervise. There were also no concerns raised that courtesy faculty do not take supervision too lightly – many of the scientists in associated institutions who are also major professors appear to excel in this capacity. This impression was borne out by the students associated with these faculty and other members of the professoriate.

Students appear to be well provided with desk space, computer access and IT support. The department has wisely invested in statistical advisors for the graduate students. It will be critical for the department to maintain this service in the face of looming budget restrictions.

Students expressed concerns about the limited collegiality in the department and especially within the college. They felt that the professors had a limited awareness or interest in what graduate students (other than their own) were working on. The department should discuss having a seminar series in which students present their proposed or in-progress research, and offer incentives to students and faculty to attend these as part of an effort to build collegiality among the faculty, graduate students and RA pool, who also play a large role in mentoring and training graduate students. Other means of increasing communication between “tribes” need to be explored within the department and college.

The graduate student survey that the students undertook for the self-study report also indicated few areas of concern other than the lack of courses in the department and the lack of teaching opportunities available to them. The research talks presented by faculty members stressed graduate students as the primary product of the department.

**Strengths**

- Attracts excellent (bright, motivated) graduate students
- Receives adequate and equitable funding through program, plus tuition waiver
- Well provided with desk, computer access, IT support
- Excellent system for providing high-level statistics support to students
- Students are made aware of opportunities for professional development

**Weaknesses and recommendations**

- Limited awareness of what students are working on
  - Have student seminar series in which students present their proposed or in progress research
- Limited communication between “tribes”
  - Foster collegiality among faculty, RA, grad students
8. Administration, communication, culture

The Department of Forest Science has a Head system, with 5-year renewable terms. Strategic planning, academic leadership, budget development and control, personnel, facilities and equipment, safety and program support are listed as the Head’s primary responsibilities. Several faculty committees provide input to these areas. In general, policy decisions are made by faculty as a result of general faculty meetings and an annual two-day off-campus retreat. While this system seems to have functioned well in the short term, serious long term problems have developed with respect to inbreeding and vision.

At the review, faculty were generalized, bluntly, as senior, male, white and OSU. Approximately, 17 of 26 faculty listed in the self-study have one or more graduate degrees from OSU. More than half of the professorial faculty received their Ph.D.’s from OSU. It was noted that often highly specialized faculty positions are developed in FS and, as a result, this expertise is likely to be found at OSU. This is a conservative strategy that may have served FS well in some respects. In particular, it may be well-adapted to obtain agency funding for larger, longer term projects, which is the source of much of the graduate student funding. However some critical comments from the students and the faculty suggest that this strategy may have failed to recruit the best possible candidates in the past faculty searches. The comments of the following alumnus aptly illustrate both the strengths and weaknesses of the college (self study, v2, page 131).

“OSU Forest (sic) is a very well-funded and well-administered college, and the faculty is quite good. I did not appreciate the quality of the infrastructure during my time as a student. I now realize how rare it is for a college to have such an extensive research forest close to campus, research facilities and support like the FRL and media center, and outstanding computational infrastructure and support. Given this, I don’t understand why the college continues to hire from within rather than attracting established, world-class faculty from outside. Nearly all recent hires have some past OSU forestry connection … OSU forestry is quite good, but it could be so much better.”

There are reasons to believe that this lack of diversity is not an accident, but rather a result of flawed hiring practices. We are told that these include focusing the searches too narrowly, not having sufficiently broad faculty representation in the hiring committees, not enforcing a strict conflict-of-interest policy in hiring committees, and lacking a transparent decision-making process. The effects of these unsatisfactory practices on the faculty morale and collegiality are unmistakably negative. In the words of one faculty member:

“We have not hired the best and brightest candidates in the past. Instead, we have hired those with connections to influential people in the department. This has resulted in a culture of cliques or tribes within the department that don’t communicate effectively with one another. We desperately need new, young faculty who were trained outside of OSU and the northwest to bring their enthusiasm and fresh ideas to our department.”

In past decades, FS was an early, foresighted leader in forest ecology. This represented a form of academic diversity that broadened the department’s traditional focus. This effort seems to have matured and contracted as budgets have declined. Nonetheless, it still accounts for a large
proportion of the department budget. Recommitting to academic diversity represents an opportunity to renew this important leadership and also to diversify FS in other ways.

Having faculty members take regular sabbaticals at other schools would be one way to broaden their expertise, and should be encouraged. More importantly, by hiring faculty without OSU connections FS could reap dividends from ideas and perspectives brought in from outside OSU and from outside forestry. This diversification could stimulate new lines of innovative research and education in the department. The department must look forward and think imaginatively to, 1) enhance the department’s reputation for developing new areas in forest research, 2) strengthen the graduate program, 3) improve diversity, and 4) maintain/improve funding.

The history of FS has resulted in a divergence of faculty views and expertise. The controversy over the regeneration study published in Science reflects this divergent evolution of “differing world views of forestry.” During our face-to-face interviews with the students, they informed us that they did not feel harassed or bullied, just disappointed with the atmosphere among the professoriate in the College. One student remarked as follows in the survey reported in the self study (v 2, page 85).

“A divisive, unsupportive, confrontational atmosphere exists between “traditional” foresters and ecologists in the college and the department.”

While the issues surrounding the Science article comprise a legitimate area of academic, social and political debate, the incident was judged to reflect a lack of collegiality on the part of some faculty and an imbalanced perspective by the college administration. Lack of diversity among the faculty especially at the administrative level may have contributed to a degree of insensitivity and intolerance to different points of view. With regard to the Science article controversy, we suggest that the Department and College administration neglected their responsibility in both the faculty/student clashes and the political confrontations arising from this paper. Faculty members who threaten colleagues with professional destruction need to be dealt with firmly. Though it seems to have been a peculiar set of circumstances that resulted in the students bearing the brunt of the criticism, it should not be their responsibility to deal with this. Nonetheless, there was praise for the maturity with which the students conducted themselves.

The facts and issues surrounding this incident are complex, but the perception of them runs counter to the concept and spirit of open, innovative research and scholarship. This cannot help and will likely damage the reputation of the Department of Forest Science and College of Forestry if not the whole of OSU. Universities should be looked to as objective sources of knowledge, innovation, debate and progress. Polarization such as has occurred inevitably damages the graduate program. After the review, one student stated that there was an atmosphere of fear, retribution and mistrust at the height of the public furor.

Dealing with these issues was thought by some to be a question of improving communications and was viewed by FS as an opportunity to improve communication within the Department, between Department and College and between Department and external stakeholders and collaborators. We are skeptical that this is the only problem, because the recent controversy seems to be a culmination of long-term trends in the COF.

Publication of the Science article and the publicity it generated also raised questions about the funding sources of the college, policy advocacy of its administrators, and the potential conflicts of
interest these could entail. We believe that it is in the long-term interest of the college and the university to encourage and develop strong research programs on all sides of the “differing world views of forestry.” Conscious efforts to encourage this diversity of views and to provide ways for productive and collegial interactions between faculty members of different world views would make the university a much more exciting place where knowledge is created by constant debate and reevaluation of the status quo.

**Strengths:**

- The department generally has a good system of administration which both expects and receives faculty support.
- There has been a strong commitment to maintaining infrastructure, especially computing and statistics.
- Research strength has provided a major source of financial support to the department and the graduate program.

**Weaknesses:**

- Budget declines have reduced faculty numbers and raised questions about how to define future faculty positions.
- Current funding and research models, e.g., lack of group research projects that span the spectrum of product-related research and more fundamental research, tend to force faculty apart, reducing interaction and collegiality.
- The department seriously lacks faculty diversity not only in race and gender, but also in faculty alma mater.
- Hiring practices are unsatisfactory, and appear to encourage inbreeding and a conventional outlook towards the future of forest science.

**Recommendations:**

- There should be a continued commitment to forests as a whole, leading to an expansive, forward-looking vision of forestry. The two camps of the forest science must be bridged by pursuing the common ground between the production-oriented research and the ecological and biological research.
- Faculty searches must be focused broadly and should seek the strongest possible candidates regardless of cultural, regional, or even forestry background.
- The department must implement a diversity plan that includes a strong preference for external candidates. The faculty search process should be reformed so that the search committee acts on behalf of the faculty to conduct a broad search, then summarize and prioritize the applications. The faculty as a whole reach consensus 1) on the candidates to interview and 2) the final recommendation.
- Cross-departmental communication should be facilitated by encouraging group research projects with multiple PIs, and by having a college-wide colloquium or annual mini-symposium to exchange and debate research and views within COF and FS.

**Appendix**

**Site Visit Agenda**
<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Event/Interview/Participants</th>
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<tbody>
<tr>
<td>Sunday, April 9</td>
<td>Working Dinner&lt;br&gt;Review Teams: CSREES and Graduate School&lt;br&gt;&lt;em&gt;Sally Francis, Dean of Graduate School&lt;/em&gt;&lt;br&gt;Location: Hilton Garden Inn</td>
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<td>Monday, April 10</td>
<td>Program Overview&lt;br&gt;Review Teams&lt;br&gt;&lt;em&gt;Tom Adams, Department Head&lt;/em&gt;&lt;br&gt;&lt;em&gt;John Hayes, Associate Department Head&lt;/em&gt;&lt;br&gt;&lt;em&gt;Penny Wright, Office Manager&lt;/em&gt;&lt;br&gt;Location: Richardson Hall 115</td>
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<td>8:45 – 9:15</td>
<td>College Dean&lt;br&gt;Review Teams&lt;br&gt;&lt;em&gt;Steve Hobbs, Executive Associate Dean, College of Forestry&lt;/em&gt;&lt;br&gt;Location: Richardson Hall 115</td>
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<td>9:15 – 10:00</td>
<td>Graduate Program Coordinator/Curriculum Committee&lt;br&gt;Review Teams&lt;br&gt;&lt;em&gt;Steve Radosevich, Graduate Program Coordinator&lt;/em&gt;&lt;br&gt;&lt;em&gt;Barbara Bond, Lisa Ganio, Dave Hibbs&lt;/em&gt;&lt;br&gt;Location: Richardson Hall 313</td>
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<td>10:00 – 10:15</td>
<td>BREAK&lt;br&gt;Review Teams&lt;br&gt;Location: Richardson Hall 313</td>
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<td>10:15 – 11:30</td>
<td>Graduate Students&lt;br&gt;Review Teams&lt;br&gt;Location: Richardson Hall 313</td>
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<td>11:30 – 12:30</td>
<td>Graduate Faculty&lt;br&gt;Review Teams&lt;br&gt;Location: Richardson Hall 313</td>
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<td>12:45 – 1:30</td>
<td>Lunch&lt;br&gt;Review Teams&lt;br&gt;&lt;em&gt;Sally Frances, Bruce Rettig&lt;/em&gt;&lt;br&gt;Location: Memorial Union 207</td>
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<td>1:30 – 2:30</td>
<td>University Administrators Meeting&lt;br&gt;Review Teams&lt;br&gt;&lt;em&gt;Sabah Randhawa, Provost and Executive Vice President&lt;/em&gt;&lt;br&gt;&lt;em&gt;John Cassady, Vice President for Research&lt;/em&gt;&lt;br&gt;&lt;em&gt;Becky Johnson, Vice Provost for Academic Affairs&lt;/em&gt;&lt;br&gt;&lt;em&gt;Steve Hobbs, Executive Associate Dean, College of Forestry&lt;/em&gt;&lt;br&gt;&lt;em&gt;Sally Francis, Dean of the Graduate School&lt;/em&gt;&lt;br&gt;Location: Memorial Union 207</td>
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<td>2:45 – 3:30</td>
<td>Tour of Richardson Hall</td>
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<td>3:30 – 3:45</td>
<td>BREAK</td>
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<td>Review Teams</td>
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<td>3:45 – 4:15</td>
<td>Debriefing</td>
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<td>Review Teams</td>
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<td><em>Tom Adams, Department Head</em></td>
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<td>4:15 – 5:00</td>
<td>Executive Session</td>
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<td></td>
<td>Review Teams</td>
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Nuclear Engineering and Radiation Health Physics program review

I. Summary of findings and recommendations

The external review of the graduate programs in the department of Nuclear Engineering (NE) and Radiation Health Physics (RHP), College of Engineering, Oregon State University, was conducted on February 13, 2006 by three internal and two external reviewers. The review team overall was favorably impressed with the graduate programs. Both NE and RHP graduate programs are well regarded nationally due in large part to the department’s expertise in reactor safety/thermal hydraulics and radiation health physics. This high regard is despite the fact that the state of Oregon has no power producing nuclear plants. The department self study highlights the strengths of the program in its current state while acknowledging future challenges. Graduate students were overall highly satisfied with their programs and faculty. The department chair and faculty are to be commended for maintaining strong graduate training programs despite budgetary and other constraints. The review team makes the following suggestions in an effort to help improve and maintain the quality of the currently strong programs.

- Faculty are overburdened and will not be able to meet the rapidly increasing demand for the more graduates without a serious investment by the College and University. As top ranked programs among only a handful of similar programs nationwide, NE and RHP are great assets to the College and University. The graduate programs risk losing national stature due to staffing challenges and/or becoming overly dependent on unstable external funding. We recommend an increase in full-time, tenure-track faculty.

- Faculty need to find a mechanism to reduce teaching loads to compensate for high productivity in research and obtaining research funding. This recommendation was made in 1991 and remains unaddressed.

- Faculty need to re-evaluate the under-utilization of graduate teaching assistants as a means to reduce the undergraduate teaching load.

- Demand for graduates is high and expected to increase dramatically in the near future. Overall graduate student quality is very good; however, an equal number of equally qualified applicants are not admitted due limitations based on funding, faculty size and research interests. The college and department need to consider means to expand the program to take advantage of increased demand for graduates and adequate supply of qualified applicants.

- Faculty are encouraged to participate in on-going graduate programmatic assessment based on academic goals. Faculty productivity in terms of revenue generation appears to be over-emphasized relative to publication quality. Collection of data on graduate applicants and admittants should be on-going.

- Require all graduate students to complete at least one application annually for external funding. The department should offer to cover the expenses of application submission, including costs of requests for official transcripts.

- Reverse the downward trend in the number of scheduled seminars. Do not schedule more than one seminar at any one time.
• Consider offering special seminars or colloquia centered on ethical issues specifically for graduate students.

• The department deserves commendation for an exceptionally detailed and very useful graduate student handbook.

• Find innovative ways to offer more stand alone graduate courses at the 500/600 levels.

• Faculty should proceed cautiously with the plan for a new joint-degree program in Medical Physics in collaboration with OHSU.

• The reactor, APEX facility, radiation center, and radiochemistry lab are exceptional facilities. However, they appear to be significantly influenced by funding sources and could be better integrated with the academic mission.

• Better integrate the research of the NE and RHP disciplines with each other and with the strengths of the department and University in environmental measurement and assessment.

• Develop and integrate a department-level diversity action plan with the College of Engineering’s plan to increase diverse gender and ethnic representation among graduate students, faculty and staff.

The major, over-arching theme of the review is that the current faculty in NE-RHP, while successfully generating large amounts of external grant and contract revenue ($13 million in five years), are stretched to capacity by research, advising and teaching expectations. Although the department is well positioned in terms of facilities and faculty expertise to support the expected resurgence in the US nuclear industry, the review team is concerned that the department be able continue to supply a quality graduate education to an expanded student population. Essentially, 8 faculty appear to advise all 29 graduate students in NE and RHP. Four new faculty joint appointments are being discussed in collaboration with Idaho National Labs; the College of Engineering has offered additional funds for two 0.5 FTE positions. However, these measures do not adequately address the core problem of too few faculty.

Demand for NE Masters and PhD graduates is high and is anticipated to rapidly increase beyond the capacity of existing national programs. The Nuclear Regulatory Commission, national laboratories, and power plant industry are hiring. With expected rapid expansion in orders for new nuclear power production plants, employment also is expected to increase in radiation health physics. This is a major reversal of trends in the industry since the 1970s. The department needs to develop a plan to position itself for increased expansion or risk losing its national reputation.

The NE and RHP disciplines could be better integrated to increase potential for even greater national recognition. For example, OSU has the ability to be nationally recognized in radiation and its use in assessment of radiation and radioactivity. The radiation health physics program could benefit by increased focus on its basic strengths-- environmental sampling and measurement, modeling and assessment of legacy and current sites, and radiation detectors and their use. The potential exists for national recognition for radiation detection and use of detectors and the department should seize this opportunity. Currently, radiochemistry is narrowly focused on plutonium chemistry. Given the strengths of environmental studies at OSU, radiochemistry could be an important University asset if integrated with the department’s expertise in environmental measurement and assessment.

Discussions are currently underway to further expand the department’s graduate programs by adding a new program. Oregon Health Sciences University (OHSU) has approached NE & RHP to
collaborate on the creation of a new accredited joint degree program in medical physics. OHSU is hiring a board-certified Medical Physicist to oversee such a professional degree program but requires access to NE and RHP facilities on the OSU campus. Appealing features of the new professional program include increased tuition revenues from paying graduate students, increased alignment with the needs of the state of Oregon for Nuclear Medicine specialists, increased utilization of the teaching/research facilities, and increased compensation for graduates of the Medical Physicist program as compared to Radiation Health Physicists. Potential disadvantages of this expansion into Medical Physics include the further stretching of an already over-burdened faculty and a shifting of resources from Radiation Health Physics, which may potentially damage this highly regarded program. The faculty are urged to proceed cautiously with this plan.

Graduate students reported the faculty to be accessible, collegial, and supportive, with frequent social occasions planned for the group as well as individual advising and collaboration. We observed evidence of a strong rapport among the graduate students in the Department; they knew each other by name and were aware of one another’s areas of study/research. Student morale was high, perhaps reflecting a resurgence of the industry and job market. The Department has compiled a very detailed and informative graduate student handbook that is one of the best on campus.

The group of graduate students with whom we met expressed concern that there were many graduate courses in the catalog that had not been offered in several years. Several students mentioned that they found it difficult to find enough graduate credits to fill their programs of study. Other students wished that they had more elective course opportunities within the department. Additionally, a primary issue of concern of the review team is the large number of 400/500 (“slash”) courses that are currently offered by the department.

Some graduate students would like more teaching experience. Approximately 25% expect to pursue academic rather than careers in industry, national laboratories or hospitals. Better utilization of graduate teaching assistants in undergraduate courses could reduce the teaching load of the faculty and provide for greater training opportunities for interested graduate students. The faculty appeared to be unable to reach a consensus on this issue at this point, but circumstances require a comprehensive re-evaluation.

During the review, faculty members expressed worry that funding of graduate students is unstable due to dependence on external research grants. One means to address this issue is to take better advantage of competitive external graduate fellowship opportunities. Graduate students would like more timely information on available external funding opportunities; Dr. Reyes indicated that responsibility to better provide this information was recently assigned to a departmental staff member. Additionally, graduate students expressed an interest in greater practice with grant-writing and suggested that an annual curriculum requirement should be a completed application for an external fellowship. The students would like the expense of the application (including costs for transcript transmission) to be reimbursed by the department.

No mention was made of attempts to further increase the gender and ethnic diversity of the majority white male graduate students or faculty. The department should develop a diversity action plan in consultation with professional expertise. The College of Engineering has hired a professional faculty member to explicitly increase gender and ethnic diversity in all departments of the College who should be consulted. As noted by one reviewer, there are very few photos of women or underrepresented ethnic groups among many photos of Nuclear Engineers and Physicists in the Radiation Center building.

Criticisms of the self-study document include the appearance that it was developed by one or two key writers. Time constraints may have made it difficult for faculty examination of issues and consensus on major goals. The faculty is encouraged to use the data sets in the document to consider its
major goals for the next few years and how best to achieve them. Additionally, the self-study tended to use revenue as a metric for quality a bit too much rather than academic goals and peer-reviewed publications. Finally, the graduate applicant and admittant metrics were only collected for two previous years (2004 and 2005) rather than the five years requested by the Graduate School. The department is highly encouraged to begin a system whereby all required data are collected and tabulated each year on all graduate applicants and admittants for ongoing self-assessment.

II. Detailed findings

A. Review specifics

The graduate program in the Department of Nuclear Engineering and Radiation Health Physics was reviewed on February 13, 2006. The five member review panel included three internal and two external reviewers: Theresa Filtz (review team Chair; OSU Dept. of Pharmaceutical Sciences) and Rod Harter (OSU, Dept of Health and Human Sciences) who are members of the graduate council; Mary Jo Nye (OSU, Department of History) who was appointed by the graduate school; James Martin (Univ. of Michigan, Dept. of Environmental Health Sciences, Professor Emeritus); and Richard Wright (Westinghouse Electric, Pittsburgh, PA). Dr. Wright had extensive prior interactions with the department, particularly with Dr. Reyes, as part of a contract with Nuclear Engineering to safety test a Westinghouse-designed passive flow reactor. The review committee met with Dean Sally Francis of the graduate school on Sunday evening, Feb. 12, 2006, for dinner to discuss review procedures and to assign reviewer responsibilities.

The site visit agenda for Feb 13, 2006 is attached and included meetings at the Radiation Center (35th and Jefferson, Corvallis) with John Cassady, Vice President for Research at OSU; Ron Adams, Dean of the College of Engineering; Chris Bell, Associate Dean of the College of Engineering; Jose Reyes, Department Chair; Qiao Wu, Graduate program Chair; all nine faculty members of the department; the Reactor staff, and most of the graduate students. Reviewers also conducted a tour of the Radiation Center facility including the TRIGA nuclear reactor and the scale-model passive flow reactor study facility.

Each committee member was provided a copy of the self-study report (73 pages) and two volumes of appendices (2 inches) one week prior to the review. The table of contents for the self-study is appended. The self-study included the department, College and University mission statements; a list of self-study objectives and program challenges; information on faculty workload, productivity, honors and awards, and demographics; research program descriptions, facilities and funding; curriculum and course lists for the graduate program; procedures for graduate applications and admissions; applicant/matriculant metrics for two years prior; graduate student financial support and demographics; program administration; national rankings and student/alumni satisfaction survey results. Signatures attested to the participation of the faculty in the creation of the self-study.

The appendices included the College of Engineering business plan; a copy of the graduate student handbook, faculty CVs, copies of the student and alumni surveys; written responses to the surveys; detailed statistical analysis and graphics from the student surveys; teaching and course evaluation data; organizational chart; student population data for six years; and nuclear workforce supply/demand charts. Prior to and following the review, additional requests were made for information on graduate student stipend levels, time to graduation, a copy of the previous program review, a list of invited department seminar speakers and a listing of student enrollment at the undergraduate and
graduate levels in 400/500 courses. This supplemental information was provided same day or over the next few weeks.

B. Program overview

The graduate program in Nuclear Engineering (NE) was established in 1959 and became a Department in 1972 with full and continuous accreditation to the present. Radiation Health Physics (RHP) has been a degree program at OSU since 1963 and became affiliated with NE in 1991; the department name changed to Nuclear Engineering and Radiation Health Physics in 2001. The RHP undergraduate program is nationally accredited.

The NE program is ranked 9th of approximately 30 programs in the nation and is one of only a handful of programs with a 1 MWt or greater full working reactor for student training. The RHP program is ranked third nationally of six accredited programs, and the only program on the West coast.

The NE-RHP faculty list 5 primary objectives for their graduate program including to produce graduates: with high levels of competency in the disciplines, with effective individual and team worker skills, with good communication skills, and with a high regard for the profession and life-long learning. These objectives appear to focus the curriculum, pedagogy, and graduate student progression.

A previous review of the Department of Nuclear Engineering was conducted in 1991 with a follow-up review in 1993. The review was overall positive and described a high-quality, small, specialized program. Suggestions for improvement were made, but no large problems were found. At the time, the review team made the following recommendations:

1. Hire one or two new faculty, preferably including a female faculty member.
2. Reduce faculty workloads with new positions and buy-outs from research grants and sabbaticals.
3. Accelerate the recruitment of graduate students, particularly non-OSU graduates
4. Update computer and instructional material
5. Increase the production of student peer reviewed research papers.

Of the five prior recommendations, the first and the last three appear to have been resolved. The second recommendation still stands unaddressed today. Faculty workloads remain very high, limit the expansion of the program to meet anticipated demand, and are not being reduced to compensate for high productivity in obtaining research funding and expanding the research programs.

In the current self-study, the faculty identified three challenges for the program including: 1) meeting the needs of a growing demand in the nuclear energy industry, 2) aligning with the needs of the state of Oregon and the nation, and 3) developing resources to support graduate student training. The primary limitations to meeting these challenges include a shortage of faculty who are over-leveraged in terms of teaching and research appointments, a small number of graduate teaching assistantships available within the College of Engineering, the lack of a nuclear production reactor in the state, an overall decrease in state funding for higher education, and a shortage of trained professionals to expand the professoriate given the growing demands of industry. The Department has developed several strategies to deal with these issues including discussion of a collaboration with Idaho National Labs which may yield up to four part-time or full-time faculty lines. An agreement with the Dean of the College of Engineering may provide 50% funding for two additional FTE faculty positions. The review team makes further recommendations to attempt to address the student funding and other issues.
C. Graduate Admissions, Advising and Retention

Recruitment and Selectivity:
Recruiting is overseen by the department’s marketing specialist, and funds are made available from the Dept. and COE to bring some candidates to OSU for a campus visit. The department sets up a recruitment booth at national meetings in order to recruit students both in and outside the Pacific Northwest, and faculty members recruit at OSU (mainly in Physics and Mechanical Engineering), OIT, and PSU. No mention was made of specific attempts to recruit underrepresented ethnic or female students.

The department recruits OSU undergraduates for the graduate programs, as well as non-OSU students. OSU students with the bachelor’s and master’s degrees from OSU may be encouraged to go into Ph.D. programs elsewhere, but there is disagreement among faculty members about this strategy. Currently 6-7 M.S. students took their B.S. degrees at OSU. Recruits who have enrolled in the graduate program include not only degree holders in nuclear engineering or radiation health physics, but also from physics, chemistry, environmental sciences, and natural science. Of seventeen students who met in a session with the Graduate Review Committee, seven had non-engineering undergraduate degrees.

In the admissions evaluation process, GPA was noted as the most important criterion, followed by statement of interest and letters of recommendation. GRE scores are not mandatory, but figure in assistantship and fellowship offers. Ph.D. students are admitted only if a faculty member makes a commitment to serve as major advisor. About half of applying students are not admitted; however, for the past two years, admitted students appear to be of the same or higher quality than rejected students. Thus, the program could double in size without any decline in student quality. Faculty members expressed concern that they could not admit more Ph.D. students. The number of graduate students admitted into the program is currently at capacity based on number of faculty. In 2005, three faculty advised 6 MS students and 2 or 3 Ph.D. students each, while other faculty members had fewer total advisees.

Graduate Student Demographics
Of new students admitted in 2004 and 2005 in nuclear engineering, 3 of 23 (13%) were female, 5 were international, 1 was Asian/Pacific Islander and 2 declined ethnic identification. Admitted to Radiation Health Physics in 2004 and 2005, 4 of 20 (20%) were female, 1 was international, 2 were Black, 2 were Hispanic (total of 20% underrepresented minorities), and 5 declined ethnic identification. Faculty members noted, in discussion of the ratio of international to domestic students, that international students are more expensive for the department, and that this is a consideration in admission. No mention was made of attempts to recruit a more diverse student population in terms of gender or underrepresented minorities. As noted by one committee member, there are very few photos of women or underrepresented groups among many photos of Nuclear Engineers and Physicists in the Radiation Center building.

Student Financial Support:
Nine-month graduate assistantship stipends are awarded at five dollar-amount levels, depending on the student’s experience, with some students also receiving additional summer stipends. Twenty-one students currently have stipends and/or fellowships, most at a .40 FTE, for which the monthly remuneration ranges from $1,321 to $1,522. Most assistantships are for research, funded by faculty members’ external grants. Only four teaching assistantships currently are available. Teaching assistants
help with grading and preparing materials, give occasional lectures, or share responsibility for an introductory course. A few fellowships are available (now at $25,000), but 0.20 assistantships are usually also awarded to a fellowship student since the fellowship does not cover tuition. Faculty members worry that funding of graduate students is unstable due to dependence on external research grants. Students would like more information on available external funding opportunities. Dr. Reyes indicated that this responsibility was recently delegated to a departmental staff member. Graduate students suggested that a curriculum requirement should be a completed application annually for an external fellowship with the expense of the application (including costs for transcript transmission) reimbursed by the department.

**Orientation and Advising Programs:**
Each student is assigned a major advisor upon matriculation. Quarterly reports of progress are required from each student working on a thesis or dissertation. Faculty members as advisors meet weekly with their group of students or with individual students. Students reported the faculty to be accessible, collegial, and supportive, with frequent social occasions planned for the group as well as individual advising and collaboration. Three weekly seminars are offered by the department, which all meet on Tuesdays. Students suggested that the seminars be scheduled at different times so that students might occasionally attend a seminar outside their own specialty.

**Student Performance:**
Master’s students are expected to complete the program in two years, which is a pre-requisite for entry into the Ph.D. program. Retention and time to degree does not appear to be an issue.

**Job Placement and Employer Assessment:**
Graduate students do not seem concerned about placement and cite successful experiences of more senior students in the program, as demonstrated in the department’s self-review document. The industrial representative on the review team indicated that demand for all graduates is extremely high and is projected to increase further.

**D. Curriculum**
A statement of the curricular goals of the Nuclear Engineering and Radiation Health Physics program was provided in Section 1.0 – INTRODUCTION of the Self-Study.

**Graduate Student Handbook**
The Department has compiled a very detailed and informative graduate student handbook that is current and up-to-date. The 2004-2005 edition included in the Self Study materials is a 49-page document that begins by welcoming the new students to the program, and continues with helpful sections entitled “Getting Settled” and “Special Services at OSU”. This document is one of the most comprehensive and student-friendly manuals on campus.

**Sufficiency and Quality of Required Courses**
The group of graduate students with whom we met expressed concern that there were many graduate courses in the catalog that had not been offered in several years. Several students mentioned that they found it difficult to find enough graduate credits to fill their programs of study, particularly if
they had obtained their undergraduate degree from OSU. Other students wished that they had more elective course opportunities within the department.

A primary issue of concern is the large number of 400/500 (“slash”) courses that are currently offered by the department. Of the 23 graduate courses offered in the Nuclear Engineering program from 2003 to 2005, 12 (52%) were 400/500 “slash” courses. In the Radiation Health Physics program during the same period, 7 of 12 (58%) graduate courses offered were 400/500 level “slash” courses. We suggest that the Department look for innovative ways to offer more stand alone, bona fide graduate courses at the 500/600 levels.

**Access to Teaching Instruction and Teaching Opportunities**

Approximately 25% of the students indicated an intention to pursue academic careers rather than industry, national laboratories or hospitals placement. Students who had interest in academic appointments expressed interest in gaining more experience in the classroom as a lecturer. Other students heading directly into nuclear energy industry jobs did not consider this as high of a priority. Utilizing interested graduate students as teaching assistants in undergraduate courses could be a great opportunity both to reduce faculty teaching load and to improve training in the graduate program.

**New program initiatives**

The department chair has identified the establishment of a Medical Physics graduate program as a key feature of his vision of the future. Dr. Reyes cited the success of other Medical Physics programs in other universities, and the willingness of OHSU Medical School to work collaboratively in this effort. Medical Physics graduate students would be expected to generate tuition revenues equivalent to other health-related professional programs on campus and would not appear to require assistantships. Development of an accredited, collaborative Medical Physics program would support health care needs in the state of Oregon—an important consideration given the lack of a power production nuclear reactor in the state. However, adding a new graduate program would be difficult to accommodate with current staffing and could further strain the department’s limited resources. Although the department could realize efficiencies from overlap between Medical Physics and Radiation Health Physics offerings—and the extant computational resources would be a significant asset—the department’s thriving Radiation Health Physics program could be adversely affected by diverting faculty resources.

At this stage, the form of the collaboration with OHSU is not clear. Partnering with a recognized medical physicist and a goal of accreditation within a few years would be minimal requirements. The focus of the planned program—therapy physics, radiologic imaging, or nuclear medicine, or all three—hasn’t been detailed. Despite its revenue-generating appeal and high level of compensation for graduates, Medical Physics is a demanding discipline with significant peer expectations. The Department, College and the University need to evaluate carefully whether significant necessary investments can be made to support such a program. The nature of the partnership with OHSU, the direction of the tuition revenue stream, costs of administering a program in two locations, costs of student access to facilities at OHSU, and costs of needs for additional faculty expertise should be carefully analyzed.

A leadership program is being considered as a partnership with industry. One reviewer noted that “Leadership is difficult to teach; it occurs naturally by turning out the best students; i.e. the best lead.” However, there appears to be considerable enthusiasm in the department for the program.
E. Scholarly Community

Ethics and Professional Skills Training

In our group meeting with graduate students and faculty, we learned that the graduate students had ample opportunities to discuss the ethical issues related to nuclear energy and radiation exposure. A 300 level course is available to undergraduates on societal aspects of nuclear technology. However, special seminars or other modes of ethical guidance for graduate students could be useful. Within the department, professional skills training is something that is generally done on a one-to-one basis, between major professor and graduate student. There seems to be variable opportunities for graduate students to obtain grant writing experience, and the students voiced interest in having expanded roles in this process.

Department Seminar Series/Journal Clubs

The Department offers a graduate seminar nearly every term, with different topics taught based upon the expertise and interest of the faculty member assigned to teach the course. According to a list provided by the Department, 43 seminars and colloquia have been held since January 2003. The least number of seminars and colloquia during that time period occurred during the 2004-2005 academic year when only 7 were held, a downward trend that the students would like to see reversed. Additionally, the various research laboratory groups in the department each have their own informal, journal club-type of small group meetings and discussions.

Access to Internship/Externship Experiences

Excellent internship/externship opportunities exist for the graduate students in nuclear engineering as well as radiation health physics. Many of these externship experiences lead to full-time employment opportunities for students following completion of their graduate programs. The department is pursuing the design of a leadership pipeline program in collaboration with industry wherein graduate students will have a mentor and two undergraduate trainees.

Student Participation on Departmental Committees

The Department has a Student Advisory Committee, a group of 10 to 12 individuals with six categories of student representation. Dr. Reyes chairs the meetings of this group, whose charge it is to provide student input on departmental issues. The students we spoke with were very enthusiastic about the role played by this student governance committee.

Graduate student productivity and attendance at Professional Conferences

Graduate students appear to be publishing at a good rate; the department notes 12 graduate student publications in the past year. The vast majority of the graduate students we spoke with had attended one or more professional conferences, and many had made presentations, or were co-author of presentations at these meetings.

Cohesiveness of the Graduate Student Group and Student Satisfaction

We saw evidence of a strong rapport among the graduate students in the Department, as they knew each other by name, and were aware of one another’s areas of study/research. Students we talked with were very pleased with their experiences in both the Nuclear Engineering and Radiation Health Physics graduate programs. The student morale was high, perhaps reflective of the resurgent job market in nuclear energy, as well as the curricular changes that been implemented within the past few years.
F. Faculty

Productivity and Teaching Load

In general, the department is well positioned to support the expected resurgence in the US nuclear industry. As one of the few departments in the country, they have the facilities and expertise to supply quality education at the graduate level in the NE and RHP. The faculty has broad and diverse skills with impressive credentials. Many hold important positions in national and international professional societies. The department notes the acquisition of $13 million in external funding over five years.

The self study indicates that there are 8 full-time and 4 part-time faculty, but closer examination shows that two are emeriti, one is assigned to the office of research, one is on offsite assignment with return rights, one administers the department, and one directs the radiation center and reactor. Thus, only eight faculty are listed as currently advising graduate Masters and PhD students. The productivity of the group under such circumstances attests to an extraordinary commitment.

However, the faculty also appears to be stretched to the limit, mentoring a broad range of MS and PhD students and providing the undergraduate curriculum. Faculty each teach four courses per academic year. The College of Engineering and the University should recognize that these are potentially tenuous circumstances and take steps to preclude shortages or decay in programmatic quality. Discussions with the Department Chair, Dr Reyes, and Dean Adams revealed that attempts to leverage additional faculty positions are underway. Four joint appointments are being initiated with Idaho National Labs which will provide additional faculty expertise and potential graduate mentors. However, there are legitimate concerns about departmental participation and distractions of faculty with a split appointment at a distance. Additionally, the College of Engineering has offered additional funds for two 0.5 FTE positions, with the remaining FTE to be leveraged from departmental resources. However, in this scenario, the department risks becoming overly dependent on unstable external grant funding. The review team feels strongly that these measures do not adequately address the core problem of too few faculty. We recommend an increase in full-time, tenure-track faculty.

As important as adding new FTE, the faculty are urged to better utilize graduate students as teaching assistants in the undergraduate program. NE and RHP faculty employ few adjuncts or teaching assistants in undergraduate courses. The faculty expressed concern that graduate students would be less capable in a 100 level engineering class of recruiting undergraduates into the NE and RHP disciplines. Faculty need to further investigate the validity and source of this concern.

Research

Faculty research interests are weighted heavily toward thermal hydraulics and graduate student theses mirror this. Radiation health physics is also a significant programmatic focus and reflects the department's healthy and welcome commitment to this discipline. Additionally, the department has expertise in more traditional nuclear engineering areas not particularly noted for specialization (but that perhaps could be) including, for example, use of the reactor and use of the APEX for safety studies of advanced reactor designs. The department has excellent computational facilities that could be used to assess safety systems, and facilities to study dosimetry and radiation interactions in shields and detectors. Another area for faculty to potentially capitalize upon could be the integration of radiation health physics into the APEX facility to study ways to optimize health physics for new reactor designs. Systems analysis engineering may be applied to identify a reduction in the reactor areas requiring exposure/contamination controls, thus saving personnel dose, control costs, etc.
The radiation health physics program could benefit by increased focus on its basic strengths--environmental sampling and measurement, modeling and assessment of legacy and current sites, and radiation detectors and their use. Research and teaching in these areas have the potential to be premier among existing programs in the nation. The potential exists for national recognition in radiation detection and use of detectors; the department should seize this opportunity. The department’s skills in assessment could be applied to forecasting source terms for advanced reactor designs and routine and emergency response thereto.

Radiochemistry research programs are unique to NE/RHP programs. However, at OSU, they appear narrowly focused on funded work on plutonium chemistry and appear almost out of place. Radiochemistry could be an important asset if integrated with environmental measurement and assessment.

G. Facilities and Administration

Adequacy of staff to support the curricular goals.

The department faculty is addressed in section F of this report and will not be addressed here. The department is housed in the Radiation Center which is separate entity and has its own staff. Since this facility is inextricably associated with the department, no differentiation will be made between the two staffs. Overall, the impression is that the staff is adequate to support the curricular goals given the current graduate student load. Students feel that they have easy access to the staff both to further their education, and to provide help and guidance.

Department Chair.

Dr. Jose Reyes is a relatively new chair, having assumed the position in the past year, in a department that seems to run very smoothly, especially given the high research productivity and teaching loads of the faculty. Dr. Reyes appears to have a good working relationship with the faculty and staff. Interviews with the students indicated that there are few problems that affect their studies and research. The faculty, staff and graduate students are satisfied and enthusiastic about the direction of the department. The relationship with the Radiation Center seems to be very cooperative. Dr. Reyes recent assignment in Vienna with the International Atomic Energy Association has the potential to broaden the role of the department in the international nuclear community.

Dr. Reyes’ vision for the future of the department seems to coincide with the recent upturn in demand in the nuclear power industry. He recognizes that the increase in demand for graduates will continue to accelerate, and that his faculty will soon be overwhelmed. While the faculty seems enthusiastic and progressive, increased workloads from an increasing student population will limit their ability to conduct and supervise research. As discussed above, Dr. Reyes was approached by OHSU to establish a Medical Physics graduate program in the department. Dr. Reyes is enthusiastic, but the review team remains concerned that adding a major new thrust would further strain the department’s limited resources.

Research Facilities

The research facilities available to graduate students in the department are world class. As was emphasized by Dr. Reyes, a research reactor seems an absolute necessity for a healthy nuclear engineering department. The reactor is being run well and is well utilized for research, but it is not a self-supporting facility and is not expected to be. Department of Energy sponsored conversion of the
reactor to low enriched fuel will allow for new characterization of the facility and will provide a foundation for additional research in the short and long term. Gary Wachs, Todd Keller and Steve Smith are to be commended for their administration of this facility. The addition of a full-time reactor administrator should assure the current high standards and increase research opportunities.

The thermal-hydraulic testing facilities are probably the best in any American university. The APEX facility for performing integral systems tests on advanced passive reactor designs is virtually unique. Innovative experimental scaling performed by Dr. Reyes helped to create a unique facility for the testing of complex advanced reactors. Multiple graduate theses appear to have been produced based on experiments conducted with the APEX facility. However, looking forward, it will be necessary to develop new missions for this large and sophisticated facility now that the testing for Westinghouse has been completed.

The ATLATS facility established by Dr. Wu, while smaller scale, is also world-class and adheres to the same high quality standards. The facility is used to support advanced reactor licensing efforts in the US.
### Nuclear Engineering/Radiation Health Physics
**Graduate Program Review**

**Site Visit Agenda**  
February 13, 2006  
E130 Radiation Center

**Internal Review Team:**  
*Theresa Filtz, Pharmacy – Chair*  
*Rod Harter, Health and Human Sciences*  
*Mary Jo Nye, History*

**External Review Team:**  
*Michael Corradini, Engineering Physics, University of Wisconsin—Madison*  
*James Martin, Environmental Health Sciences, University of Michigan*  
*Richard Wright, Westinghouse Electric*

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<td><strong>Working Dinner</strong></td>
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<td>6:00 – 9:00 PM</td>
<td>Review Team</td>
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<td>Sally Francis – Dean of Graduate School</td>
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<td>Monday, 2/13</td>
<td><strong>Program Overview</strong></td>
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<td>8:00 – 9:00 AM</td>
<td>Dr. Jose N. Reyes, Jr., Head</td>
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<td>Review Team</td>
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<td>9:00 – 10:00</td>
<td><strong>Graduate Committee/Department Faculty</strong></td>
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<td>Qiao Wu, Graduate Program Chair</td>
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<td>David Hamby, Committee Chair</td>
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<td>Jack Higginbotham, Committee Chair</td>
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<td>Kathryn Higley, Committee Chair</td>
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<td>Todd Palmer, Committee Chair</td>
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<td>Jose N. Reyes, Jr., Committee Chair</td>
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<td>Brian Woods, Committee Chair</td>
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<td>Ron Adams, Dean, College of Engineering</td>
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<td>John Cassidy, Research Office</td>
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<td>Chris Bell, Associate Dean, College of Engineering</td>
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<td>Lab/Facilities Tour</td>
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<td>Graduate Students Review Team</td>
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