

September 30, 2005

MEMORANDUM TO: Ledyard B. Marsh, Director  
Division of Licensing Project Management  
Executive Director for Operations

FROM: Richard P. Correia, Acting Director **/RA/**  
Licensing Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

SUBJECT: FISCAL YEAR 2005 EVALUATION OF THE  
OPERATING REACTOR LICENSING PROGRAM

The agency's Strategic Plan for Fiscal Years (FYs) 2004-2009 includes the performance of several evaluations to determine if our programs and processes are effective in supporting established performance goals. A program evaluation team consisting of staff from the Division of Licensing Project Management (DLPM) within the Office of Nuclear Reactor Regulation (NRR) performed an evaluation of the operating reactor licensing program and prepared the attached report to meet the objectives defined in the Strategic Plan for FY 2005. Additional details regarding plans to perform the evaluation were provided in a memorandum dated March 29, 2005, from the Director of NRR to the Deputy Executive Director for Reactor Programs (Acc. No. ML050760511).

The scope of the evaluation includes those parts of the agency's Reactor Licensing Program associated with licensing actions for operating reactors (e.g., license amendments, relief requests). The evaluation team reviewed available information related to the operating reactor licensing program and discussed issues and possible recommendations with a cross-section of NRR licensing project managers, technical reviewers, NRR managers, and external stakeholders. The team acknowledged that the program remained effective given the changing and challenging environment the agency and the industry has faced over the past several years. The program has been challenged with many difficult issues and events such as materials degradation issues, increased number of power-uprated requests, plant operational issues (Indian Point, Davis-Besse, and Point Beach) and heightened focus on security matters post September 11, 2001.

Notwithstanding these challenges, overall the team found the operating reactor licensing program and the processes used to implement it remain effective in supporting performance goals. Additionally, the team believes there are opportunities for NRR to enhance and improve the program and related processes.

The report contains several recommendations for possible improvements to program efficiency and effectiveness. Consistent with previous NRR program evaluations, the team recommends that NRR assess the recommendations and, as appropriate, make changes to its internal programs and processes. In addition to the recommendations in the team's report, other possible process improvements are currently being evaluated as part of the NRR Corrective Action Program, initiatives such as the task force on requests for additional information (RAI),

and lessons learned from several recent plant-specific applications. The team also recommends that NRR continue discussions with the industry's licensing action task force and other stakeholders about possible improvements to the various activities making up the operating reactor licensing program. Several of the recommendations involve proposals that will require action by the Commission (e.g., proposed changes to the agency's performance goals). The team recommends that NRR work with the appropriate staff from the Office of the Executive Director for Operations and the Office of the Chief Financial Officer to assess and implement possible changes to the agency's reports on strategic planning, budgeting, and performance monitoring.

Attachment: Evaluation of the Operating Reactor Licensing Program

and lessons learned from several recent plant-specific applications. The team also recommends that NRR continue discussions with the industry's licensing action task force and other stakeholders about possible improvements to the various activities making up the operating reactor licensing program. Several of the recommendations involve proposals that will require action by the Commission (e.g., proposed changes to the agency's performance goals). The team recommends that NRR work with the appropriate staff from the Office of the Executive Director for Operations and the Office of the Chief Financial Officer to assess and implement possible changes to the agency's reports on strategic planning, budgeting, and performance monitoring.

Attachment: Evaluation of the Operating Reactor Licensing Program

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# **Evaluation of the Operating Reactor Licensing Program**

**September 2005**

**Program Evaluation Team**

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# EVALUATION OF THE OPERATING REACTOR LICENSING PROGRAM

## EXECUTIVE SUMMARY

The NRC Strategic Plan for Fiscal Years (FYs) 2004-2009 includes the performance of several evaluations to determine if the agency's programs and processes are effective in supporting established performance goals. A program evaluation team consisting of staff from the Division of Licensing Project Management (DLPM) within the Office of Nuclear Reactor Regulation (NRR) performed this evaluation of the operating reactor licensing program (e.g., license amendments, relief requests) to meet the objectives defined in the Strategic Plan.

The evaluation team reviewed available information related to the operating reactor licensing program (e.g., NRR dynamic web page and work planning center data on staff-hours) and discussed issues and possible recommendations with a cross-section of NRR licensing project managers, technical reviewers, and NRR managers. The team also considered feedback from external stakeholders (primarily licensees and the industry's licensing action task force (LATF)).

The team acknowledged that the program remained effective given the changing and challenging environment the agency and the industry has faced over the past several years. The program has been challenged with many difficult issues and events such as materials degradation issues, increased number of power-uprated requests, plant operational issues (Indian Point, Davis-Besse, and Point Beach) and heightened focus on security matters post September 11, 2001. The programs and processes established by NRR for processing proposed licensing actions remain effective in that they have supported maintaining safety while also supporting industry efforts to enhance operating flexibility and increase power production. While the establishment of the performance goals initially improved the efficiencies and timeliness of the NRC reviews of proposed licensing actions, the evaluation team believes that an evaluation and possible changes to performance measures, programs, and procedures will make the program more effective and efficient in achieving the agency's strategic plan goals.

In terms of the overall licensing program, the team has summarized the following recommendations (the detailed recommendations are contained in the body of the report):

- Continue to reinforce that responding to licensing applications is intended to enable the safe operation of nuclear power plants. The majority of licensing actions are proposed to maintain appropriate safety margins while providing operating flexibility or increasing power production.
- Continue to emphasize that performance measures are part of an overall system to identify and address performance issues. Put more importance on outcomes and acknowledge the goal of meeting measures with an understanding that some lower tier output measures may not be met each fiscal year.

- Focus more attention to the makeup of the inventory and performance of routine assessments of the different activities within the program. Reinforce a best practice for preparing and maintaining guidance for the staff and licensees in order to front-load the application/review process.
- Evaluate and potentially change the performance goals as follows to encourage additional improvements and provide more insights into program performance:
  - (a) Use completing 1500 licensing actions per fiscal year as a budget assumption and not as a performance measure.
  - (b) Use an inventory of less than 1000 licensing actions as a budget assumption and not as a performance measure.
  - (c) Develop specific performance measures for license amendments and other types of licensing actions.
  - (d) The average completion time for license amendments in FY06 (other than uprates and standard TS conversions), which have specific age goals) forms a baseline level from which a decreasing trend is established such that the average completion time at the end of FY09 is the lower of either 8.5 months or a 15% reduction from the FY06 baseline.
  - (e) The average labor rate for license amendments in FY06 (other than uprates and standard TS conversions, which have specific labor rate targets), forms a baseline level from which a decreasing trend is established such that the average labor rate at the end of FY09 is the lower of either 80 hours (per assigned TAC number) or a 15% reduction from the FY06 baseline.
  - (f) The completion time of all license amendment requests is less than 2 years.
- For licensing actions other than license amendments and those like power uprates that have specifically defined goals, the performance goals should be to complete 96% of actions in less than 1 year and 100% of actions completed in less than 2 years. Office or program-level goals should be established for specific types or categories of licensing actions.
- Develop and implement an “on hold” review status for use with the completion time measures (versus current age of inventory measure). The period of time during which the action is on hold would not count as part of a new (proposed) average closure time measure. The on hold status would be used on rare occasions when resource constraints or other issues prevent the NRC staff or licensee from the timely completion of a process step such as initiating a review or responding to requests for information .
- Re-evaluate guidance for charging on the job training (OJT) hours, with a goal of minimizing OJT hours charged to specific licensing actions. Additional guidance on time charges would also be useful in areas such as licensing assistants and project manager interface activities.

- Ensure that license amendments and foundational programs (topicals and technical specification (TS) task force travelers) are viewed as an integrated program.
- Continue to reinforce a more programmatic treatment of license amendments as well as the overall licensing program. Revise the work flow to simplify the process and make it more efficient for routine, less complex amendment requests. Provide additional guidance in NRR office instructions on work flow, communications, coordination and other aspects of handling more difficult amendment requests.
- Continue to reinforce the importance of preparing, maintaining, and adhering to guidance documents (for staff and licensees) for initiatives that include license amendments as part of the implementation process.
- Strengthen the process to resolve generic issues to minimize the impact on licensing action applications and related NRC reviews, and encourage licensees with multiple plants to use generic changes and joint submittals.



# PROGRAM EVALUATION

## 1.0 INTRODUCTION

The NRC Strategic Plan for Fiscal Years (FYs) 2004-2009 includes the performance of several evaluations to determine if the agency's programs and processes are effective in supporting established performance goals. A program evaluation team consisting of staff from the Division of Licensing Project Management (DLPM) within the Office of Nuclear Reactor Regulation (NRR) performed this evaluation of the Operating Reactor Licensing Program to meet the objectives defined in the Strategic Plan. The evaluation was described in the Strategic Plan as follows:

### Reactor Licensing Program

*Expected Completion Date: FY 2005*

*Objectives:* The reactor licensing program evaluation will have two objectives:  
(1) to determine whether the ongoing program is effective in supporting the achievement of the performance goals and the agency's strategic plan goals, and  
(2) to provide timely, objective information to inform program planning and improvements.

*Scope:* The evaluation will include the efficiency and effectiveness of the following program components:  
(1) review of license amendments requests,  
(2) review of relief requests, and  
(3) issuance of orders.

The evaluation will consider the process work flow, quality requirements, and roles and responsibilities for each product line in order to identify best practices for ensuring safety while enhancing process efficiency.

## 2.0 LICENSING ACTIONS

### 2.1 BACKGROUND

Within the framework of the NRC Strategic Plan and the related budgeting process, the Nuclear Reactor Safety Program includes reactor licensing (including power uprates and license transfers, operator licensing, regulation development, operating experience evaluation, and financial assurance); reactor license renewal; new reactor licensing; reactor inspection and performance assessment (including emergency response, reactor technical and regulatory training, imposition of enforcement sanctions for violations of NRC requirements, and investigation of alleged wrongdoing by licensees, applicants, contractors, or vendors); reactor regulatory research; Homeland Security efforts (including threat assessment, emergency response, mitigating strategies, security inspections and force-on-force exercises); and international efforts to enhance domestic and global nuclear safety.

The scope of this program evaluation is limited to that part of the overall licensing area related to processing licensing actions to support operating reactors. Traditionally and in the majority of current cases, licensing actions consist of proposed changes submitted by licensees to the NRC for review and approval by the NRC staff. The program is generally defined as the activities under Planned Accomplishment (PA) 111102, "Licensing Actions," and includes the following activity types:

- |      |   |
|------|---|
| - LA | License Amendments  |
| - LD | Notices of Enforcement Discretion (NOEDs)                     |
| - LE | Exemption Requests  |
| - LL | Other   |
| - LO | Orders  |
| - LQ | Program Reviews (e.g., quality assurance, emergency planning) |
| - LR | Relief Requests   |
| - LT | Plant Specific Topical Reports                                |

The existing measures of success for this area of the program are described in agency budget and performance monitoring documents as follows:

- |             |  |
|-------------|--|
| Output:     | Complete greater than 1500 licensing actions per FY. The licensing actions are counted as the number of technical assignment control (TAC) numbers with the specified PA code that are closed per FY. One or more TAC numbers are created for each application for each docket number affected by the proposed action. |
| Timeliness: | Age of the licensing inventory (counted as the number of TAC numbers within the specified PA code) is controlled such that 96% of actions are less than 1 year old and 100% are less than 2 years old (primarily reported as a snapshot of the conditions on September 30).  |

The inventory of licensing actions (counted as the number of open TAC numbers within the specified PA code) will not exceed 1000 (primarily reported as a snapshot of the conditions on September 30).

Productivity: Productivity (the resources (hours or dollars) spent to complete licensing work ) is an important budget assumption. Even though it is described in budget and performance monitoring documents, there is no specific performance measure related to productivity.

## **2.2 SCOPE OF EVALUATION**

As described in the Strategic Plan, the objective of this program evaluation is to determine if the operating reactor licensing program is effective in supporting agency efforts to meet its strategic and performance goals and to inform program planning and process improvements. The Strategic Plan stated that the scope of this program evaluation includes the efficiency and effectiveness of the NRC's handling of:

- (1) review of license amendment requests,
- (2) review of relief requests, and
- (3) issuance of orders.

The evaluation team expanded the scope to include other licensing activity types (exemptions, program reviews, and other licensing actions) to support its formulation of recommendations for possible program improvements.

The evaluation team reviewed available information related to the operating reactor licensing program (e.g., NRR dynamic web page and work planning center data on staff-hours) and discussed issues and possible recommendations with a cross-section of NRR licensing project managers, technical reviewers, and NRR managers. The team also considered feedback from external stakeholders (primarily licensees and the industry's LATF).

## **2.3 RELATIONSHIP OF LICENSING PROGRAM TO STRATEGIC PLAN GOALS**

The objective of this evaluation includes determining if the ongoing program supports the achievement of the reactor program performance goals and agency's strategic plan goals. The team assessed the relationship between the program and the strategic goals in order to focus the program evaluation to those areas where changes in the program or related processes could improve the agency's efforts to meet the strategic goals. The relationships between the operating reactor licensing program and the agency's strategic plan goals are discussed below.

### Ensure Safety and Security

Part of the NRC's role as the regulatory agency for the commercial use of nuclear power is to establish minimum requirements to ensure the licensed facilities do not introduce undue risk to the public health, safety, or security. Requirements related to the design, construction, and operation of nuclear power plants are established using regulations, orders, and licenses (including the appended TS). The NRC's reactor oversight process (ROP) includes inspections and assessments to ensure licensees conform to the regulatory requirements and are

otherwise operating and maintaining the facilities in a safe and secure manner. In terms of the current operating reactor licensing program, a set of minimum requirements has already been established as the current licensing basis for each facility. The reviews performed as part of the licensing process ensure that safe plant operations would continue following implementation of changes to the requirements that are proposed by licensees. A recent evaluation performed using the program assessment rating tool (PART) developed by the Office of Management and Budget (OMB) describes the routine licensing process in terms of enabling the continued safe operation of the operating nuclear power plants. This terminology from the agency's Strategic Plan describes the balancing of the different elements of the strategic goals by considering the strategic goal to "regulate the safe uses of radioactive materials for civilian purposes to ensure the protection of public health and safety" and also the effectiveness strategic goal (e.g., the NRC seeks to impose only those requirements that are necessary to achieve the agency's mission). The staff's decisions on specific licensing actions are based on its review of the safety and security implications with the outcome usually being safety-neutral. However, the actions are usually initiated by licensees to provide other societal benefits (e.g., reduced costs, increased production). The team believes that the program has been and remains effective.

#### Ensure Openness in Our Regulatory Processes

To achieve openness in NRC's regulatory process, resources are provided to support communicating with stakeholders and making the regulatory process accessible to interested stakeholders. The processes associated with operating reactor licensing are well established in accordance with the Atomic Energy Act and applicable NRC regulations. As defined in the regulations and agency practices, the individual processes include specific steps to ensure the public availability of documents, solicitation of comments, holding of public meetings, and noticing opportunities for the public to request hearings. Although isolated problems do arise, the evaluation team believes that the increasing use of the NRC web site, improvements in the agency's recordkeeping system (ADAMS), and other advancements have led to actual improvements in the agency's openness related to operating reactor licensing. The evaluation team notes that various organizations, working groups, and surveys routinely monitor this performance goal. Therefore, the team did not specifically evaluate or solicit feedback related to the agency's performance in the area of openness.

#### Ensure Our Processes are Effective, Efficient, Realistic, & Timely

- < Effectiveness means achieving the desired outcome from a program, process, or activity. In terms of operating reactor licensing, effectiveness is maintaining safety and security while also addressing the other performance goals. It is difficult to assess the contribution of a single program to the overall safe operation of nuclear power plants. For operating reactor licensing actions, the application process includes specific requirements on licensees (e.g., quality assurance, independent review). NRC approval or denial of a licensee's application involves reviews by appropriate subject matter experts and concurrence by designated agency managers. Inherent to NRC approval of a proposal is that facility operation following the change will maintain a reasonable assurance of safety. Based on its many years of experience in reactor licensing and the interviews of other NRR staff, the team notes that findings of adverse safety/security implications related to licensing actions are rare. In cases where conditions adverse to safety have been identified (e.g., Davis-Besse reactor vessel head degradation, Indian Point steam generator tube rupture), the contribution of the reactor licensing program

was presented as missed opportunities for identifying issues and not direct causes of the condition. Lessons learned from specific cases such as degradation of the reactor vessel head at Davis-Besse have been addressed in the applicable procedures and processes to strengthen the review and approval processes. The evaluation team believes that the program has been and remains effective.

- < Efficiency refers to productivity, quality, and cost characteristics that together define how economically an activity or process is performed. The evaluation team assessed available information related to staff productivity and makes specific recommendations later in this report for various types of licensing actions.
- < Realistic approaches to regulation requires focus on the most significant safety requirements and, in certain instances, avoiding unnecessary conservatism that offers little safety benefit. NRC efforts to be more realistic in its decision-making usually center on the risk-informed/performance-based initiatives. Given these initiatives are continually reviewed and reported on, the evaluation team did not perform significant assessments in this area.
- < Timeliness, a key product of efficiency, means acting within a predictable time frame and without unnecessary delays. The evaluation team assessed available information related to timeliness and makes specific recommendations later in this report for various types of licensing actions.
- < Quality of NRC products in the licensing program relate directly to the review and documentation of staff findings for specific licensee proposals. Feedback from internal stakeholders (e.g., Office of General Counsel (OGC) and NRR managers) and external stakeholders (e.g., licensees and LATF) regarding the quality of some NRR documents (e.g., safety evaluations) resulted in changes to NRR office instructions and other guidance documents. NRR procedures now include templates and guidance for the format and content of most licensing documents. The NRR staff is continuing to interact with the LATF and other stakeholders to improve the quality of NRC documents and the incoming applications from licensees. In addition, NRR has issued an instruction on the integrated quality initiative to provide more instruction to procedure writers and staff regarding the content of licensing documents. OGC also reviews most outgoing licensing action decisions to ensure the document adequately presents the basis for the NRC decision. In light of the ongoing activities, the evaluation team did not perform additional assessments of the quality of licensing reviews or documentation.

#### Ensure Excellence in Agency Management

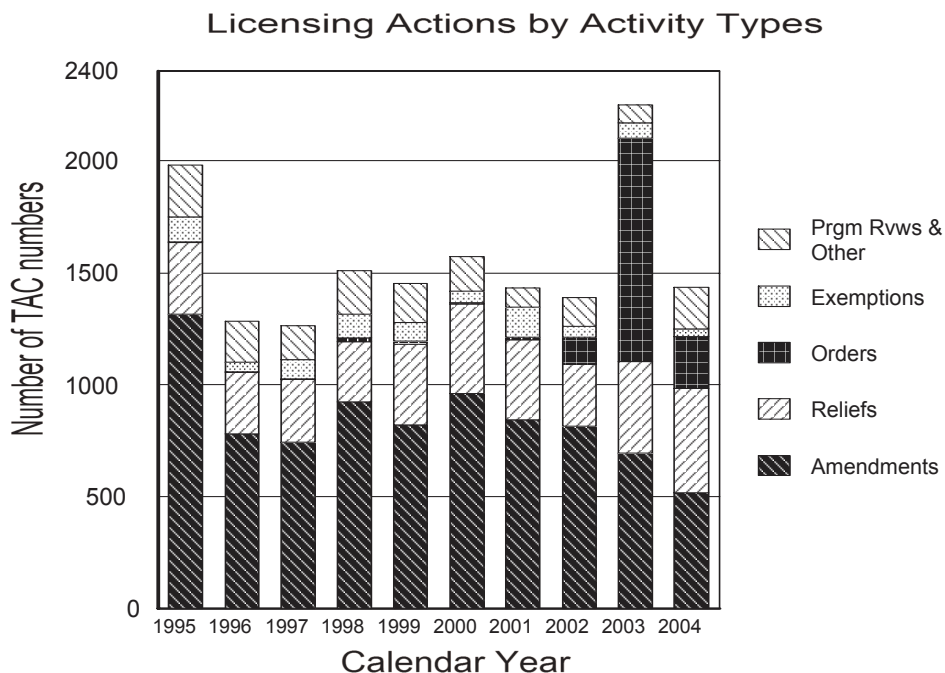
The NRC goal to ensure excellence in agency management involves the management of human capital, infrastructure management, improved financial performance, expanded electronic government, and budget and performance integration. Of these, the evaluation team believes that some enhancements related to licensing program management that could assume continued improvements include enhancing organizational and functional structures, improving the guidance provided to the staff, and improving the linkage of individual performance standards with NRC's strategic goals. Specific recommendations are provided later in this report for various types of licensing actions.

## 2.4 DISCUSSION

Figure 2-1 summarizes the licensing actions completed from calendar years 1996 through 2004.

The specific activity types (e.g., license amendments, relief requests) are discussed in more detail in the subsequent sections. The most obvious observation from the figure is the increase in orders issued in recent years. Orders related to reactor vessel heads at pressurized water reactors (PWRs) were issued in 2003 and revised in 2004. There have also been multiple sets of orders issued related to security following the events of September 11, 2001. As discussed in guidance documents issued by OMB regarding performance measures (e.g., PART), a simple counting of outputs is generally a weak performance measure. In this case (described in more detail in Section 5, "Orders"), the simple output measure (number of licensing actions) is only one measure of program effectiveness and efficiency. The staff work related to Orders, such as the reactor vessel head orders or the security orders, is primarily in the preparation of the generic order and processing the plant-specific actions is largely administrative. In addition, if one assumes that the need for the NRC to issue Orders will decrease in the future (i.e., return to pre-2001 environment), the agency would be challenged to meet the existing performance measure of completing 1500 licensing actions per fiscal year.

**Figure 2-1**



The operating reactor licensing program may be characterized by the above figure and is currently managed in terms of the overall program (consistent with the existing performance measures) and not as a composite of separate and distinct parts. For example, status reports and most internal discussions of the licensing program do not provide a breakdown by activity types (e.g., license amendments, relief requests, and program reviews) nor do they provide a discussion of ongoing or expected trends (e.g., specific exemptions, program reviews, or the grouping of license amendments). Because the different activity types involve different procedures and processes, different staff, and different levels of effort, the team believes that the program could be broken down by licensing action activity type and each type would be assessed for future budget projections and performance assessments. While it may not be practical to develop specific performance measures for each licensing action activity type, the team believes that several distinct strategic-level measures could be developed. Additional office or program-level measures would then be developed for specific activity types and for logical groupings or categories of licensing actions (e.g., similar exemptions issued to multiple licensees).

The evaluation team identified several issues during its conduct of this program evaluation that are common to all of the licensing action activity types. The issues are either apparent through similar trends (e.g., increasing labor rates) for various activity types or were acknowledged to cut across activity types during the discussions with staff and management. The common issues or observations and related recommendations are included here instead of repeating them in the discussions of each activity type.



- An issue identified by both staff and licensees is the inclusion of some on-the-job-training (OJT) hours within the hours charged to licensing actions. This could be a factor in the increasing labor rates (staff-hours charged) for the various licensing actions. The continued departure of experienced staff and hiring of new employees is probably adding to this effect. A re-evaluation of guidance for charging OJT hours and distributing time between active reviews and OJT would be useful. From the perspective of assessing and improving the licensing program, the team believes it would be best to minimize the OJT time charged to specific licensing actions.
- The team recognizes that the process of budgeting and establishing performance goals several years in advance of the work being done is a significant challenge to a program that is relatively fluid and for which the agency is largely reactive to stakeholder requests (i.e., the number and type of licensing applications is usually not known with certainty). However, based primarily on discussions with stakeholders, the team is concerned that the emphasis on meeting performance measures and related decisions on counting practices (e.g., counting one generic order as 104 individual licensing actions) actually undermines the overall strategic planning and performance monitoring objective. The team is providing several options/recommendations for revising the current performance measures for the operating reactor licensing program. It may be beneficial to enhance how NRR develops and uses different layers of performance measures (e.g., broader measures used in agency documents and more detailed measures used at office or program level). The current performance measures could be changed to better support the identification of areas where the program could be strengthened and enhanced.

## **2.5 RECOMMENDATIONS**

In terms of the overall licensing program, the evaluation team has the following recommendations:

- (1) NRR should continue to reinforce that responding to licensing applications is intended to enable the safe operation of nuclear power plants.
- (2) NRR should continue to emphasize that performance measures are part of an overall system to identify and address performance issues. Putting importance on outcomes and acknowledging that some lower tier output measures may not be met each fiscal year should be reinforced.
- (3) NRR could improve program management of the various types of operating reactor licensing actions. One way is to give more attention to the makeup of the inventory and performing routine assessments of the different activities within the program. NRR could develop and support the message that completing each action includes the finding that safety is being maintained but also that each decision is to be reached using the most productive and timely approach available. NRR management should reinforce that preparing and maintaining guidance for the staff and licensees in order to front-load the application/review process is a best practice (for power uprates) and is important to the continued success of the operating reactor licensing program. Part of the routine monitoring for any new performance goals could include the makeup of the licensing inventory and the makeup of likely applications. Significant changes in the numbers of



applications, the types of applications, or the complexity of applications might require adjustments to the metrics.

- (4) The performance goals could be changed to encourage additional improvements and provide more insights into program performance. The differences between the various licensing activity types are generally not recognized within the current performance measure. Improved measures could be used to recognize the differences between the licensing activities and be specific enough to provide insights into each area. The evaluation team recommends:
  - (a) Use completing 1500 licensing actions per fiscal year as a budget assumption and not as a performance measure. This would also better support resource planning and work activities since specific groups are more likely to be involved in specific activity types or reviews.
  - (b) Use an inventory of less than 1000 licensing actions as a budget assumption and not as a performance measure. The numbers fluctuate and the size of the inventory is inherently controlled by proposed age at closure and other performance measures.
  - (c) Develop specific performance measures for license amendments and other types of licensing actions.
    - (i) For license amendments -
      - (A) Replace the current inventory age goals with a goal related to average completion time with a specified decreasing trend. This reinforces the need to select the most efficient approach for each application and actually provides an incentive to process individual actions as efficiently as possible. It also provides incentives to develop and implement generic approaches and to prepare guidance for the staff and licensees.
      - (B) Introduce an average labor rate measure with a specified decreasing trend. With productivity included in discussions of efficiency, labor rates should be elevated from a budget assumption to a performance metric while the number and type of actions completed is switched from a measure to a budget assumption.
      - (C) Introduce a goal of a maximum completion time of 2 years for each licensing action. This is more restrictive than the current inventory age goal in that all actions are to be completed within 2 years (no use of annual snapshot) and maximum completion time metric also provides a firm backstop for the average completion time goal and further reinforces the need to resolve issues in a timely manner.
    - (ii) For other licensing actions (relief requests, exemptions, etc.) -
      - (A) Introduce measure of 96% of actions completed in less than 1 year and

100% of actions completed in less than 2 years. This is similar to but more restrictive than current inventory age goal in that measuring the age at closure does not take advantage of an annual snapshot of the inventory at the end of each fiscal year.

- (5) Develop and implement an “on hold” review status for use with the completion time measures (versus current age of inventory measure). The period of time during which the action is on hold would not count as part of a new (proposed) average closure time measure. The on hold status would be used on rare occasions when resource constraints or other issues prevent the NRC staff or licensee from the timely completion of a process step such as initiating a review or responding to requests for information. The new on hold status would be used only when there is mutual consent from the licensee and the NRC program manager. It may be appropriate to establish controls on the provision, such as setting a maximum hold time or a limit on percentage of inventory in the hold status.
- (6) Re-evaluate guidance for charging on the job training (OJT) hours, with a goal of minimizing OJT hours charged to specific licensing actions. Additional guidance on time charges would also be useful in areas such as licensing assistants and project manager interface activities.

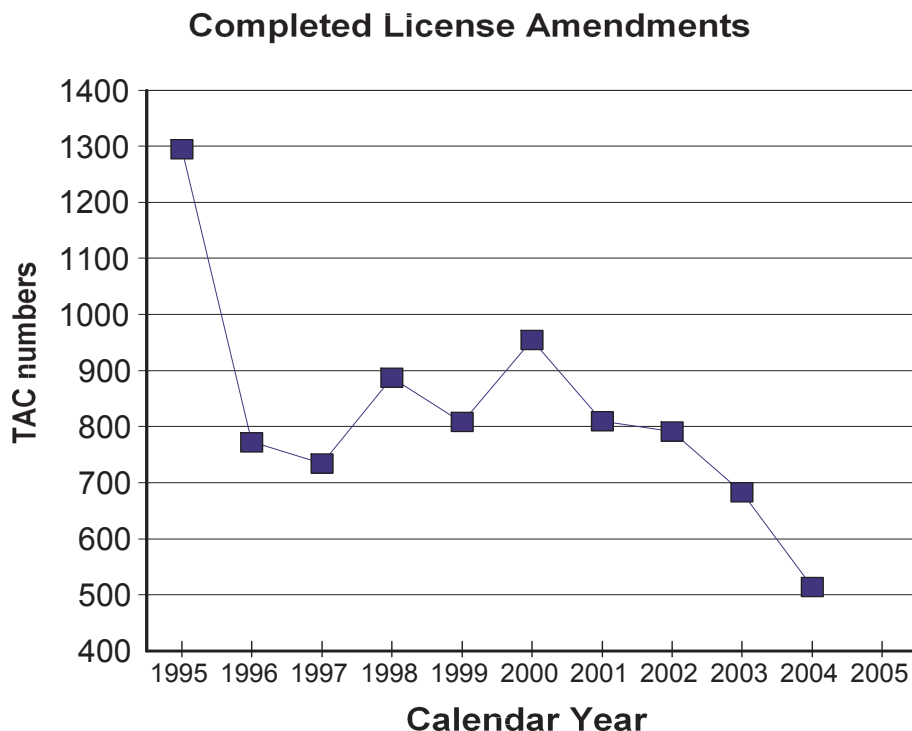
## 3.0 LICENSE AMENDMENTS

### 3.1 BACKGROUND

The term licensing actions and license amendments are sometimes used interchangeably but amendments are only a subset of licensing actions. Traditionally, license amendments make up about 60% of completed licensing actions (not counting recent orders). License amendments involve changes to the operating license, including the appended TS, or to another licensing basis document such as the updated final safety analysis report if certain criteria are satisfied and prior NRC approval is necessary. The vast majority of license amendments involve changes to the TS. Several types of amendments (e.g., conversions to standard TS, license transfers, and power uprates) are specifically identified within the NRR budget and have evolved to be their own programs with specific procedures and performance measures. These types of amendments have been removed from the data assessed as part of this evaluation.

The number of license amendments issued for each of the last 10 calendar years is shown below.

**Figure 3.1**



## 3.2 DISCUSSION

The figure shows a decreasing trend in the number of amendments being processed. The trend may be due to the fact that the nuclear industry is maturing and many licensees have adopted various TS improvements to reduce the need for routine license amendments. The evaluation team is somewhat cautious about the exact slope of the declining trend because it is influenced by the data points for 1996 and 2004. The staff closed many license amendments in 1996 when resolving a problem with a large backlog of requests. The staff closed fewer than normal license amendments in 2004 partially due to resources being dedicated to security reviews. Removal of these data points reduces the declining trend significantly. Although amendments will likely be needed throughout the operating life of all plants, it is reasonable to expect that the observed trend will reach a lower plateau. The number of amendments and related work load associated with that plateau are largely dependent on the success of efforts to increase the incorporation of risk-insights and performance-based requirements into the TS. The evaluation team believes that additional reductions are possible and should be encouraged by defining program goals to increase the incorporation of risk-insights and performance-based requirements into the TS which should minimize the need for processing future license amendment requests (e.g., reducing the prescriptive nature of requirements in TS). This is somewhat inherent in some of the risk-informed/performance-based initiatives but the team believes that this objective could be made explicit and emphasized in appropriate guidance documents.

In addition to a decreasing trend in the number of individual license amendments (TACs), another trend is an increasing number of reactor units addressed in specific applications as a result of industry consolidation. The actual work activities of the staff are more closely tied to the number of applications because there is an efficiency gain for submittals addressing multiple units. Traditionally, a ratio of 0.66 has been used to estimate the number of actual reviews per TAC number. The ratio for the first half of 2005 (influenced by D. C. Cook standard TS conversion beyond scope items and consolidated line item improvement process (CLIIP) amendments) is 0.49. The efficiency gains associated with decreasing the ratio partially explains the improved productivity (i.e., reduced labor rate) for license amendment TACs in 2005. The trend is likely to continue due to consolidation within the industry and the evolution of generic changes (e.g., TS Task Force (TSTF) travelers and CLIIP). NRR should continue to encourage the use of generic changes and joint submittals to make the process more efficient.

Another possible improvement is to better integrate activities that support future licensing actions (e.g., topical reports, TSTF travelers, and CLIIP) into the operating reactor licensing program. The CLIIP was developed to facilitate the adoption of approved TSTF travelers by individual licensees. The process also demonstrates the close relationship between the TSTF activities and the license amendment process and the possible efficiency gains by maximizing generic approaches. A subset of the topical reports processed by the NRC staff also directly support the license amendment process. These activities are closely linked and the TSTF and topical reports provide the needed front-loaded reviews and guidance to staff and licensees to meet various performance goals and other objectives. However, the TSTF and topical report activities are treated as different programs and not as an integral part of the overall license amendment process. The team believes the NRR should ensure that license amendments and foundational programs (topicals and TSTFs) are viewed as an integrated program.

The results of a licensee survey performed by Brookhaven National Laboratory (BNL) for the NRC (BNL Technical Letter Report J-3105/8-2004) included several questions on the operating reactor licensing program. Most of the observations related to license amendments and a summary of the relevant questions is provided in Table 3-1. The shaded areas show the areas where the total negative (i.e., generally and very unsatisfied) responses were greater than 10%.

TABLE 3-1 Licensee Survey						
Question	Very Satisfied	Generally Satisfied	Neutral	Generally Unsatisfied	Very Unsatisfied	Not Applicable
How satisfied were you with the quality of NRR written products (generic communications, safety evaluations, etc...)?	3%	63%	22%	8%	1%	3%
How satisfied were you with the communication skills of NRR staff?	3%	50%	28%	10%	4%	5%
How satisfied were you with the NRC-endorsed process to change commitments, which is described in NEI 99-04, "Guidelines for Managing NRC Commitments?"	16%	49%	26%	3%	0	6%
How satisfied were you with NRC's handling of licensing actions?	3%	56%	24%	13%	4%	0
How satisfied were you with the timeliness of NRC's response to license application, amendment, and/or renewal request?	9%	38%	29%	16%	7%	1%
In general, how would you rate the quality of NRR activities that you have experienced?	1%	63%	24%	11%	0	1%

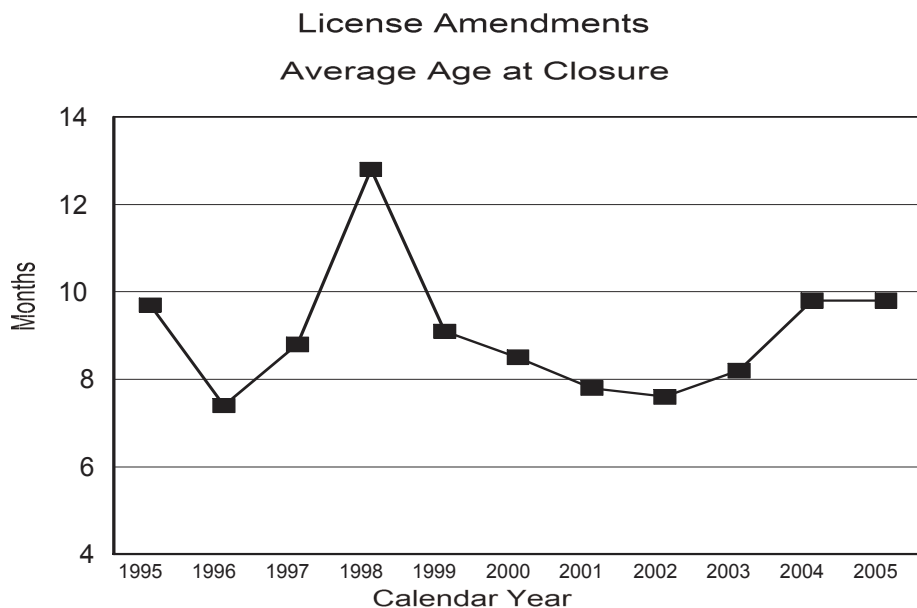
General concerns offered by those responding to the survey included:

- < the NRC staff did not understand the licensing basis for older units,
- < the NRC staff did not always effectively use precedent reviews,
- < NRC management focused on the existing performance indicators (e.g., 1 and 2 year goals) and not resolving issues
- < NRC did not effectively schedule reviews and other activities, and
- < important initiatives (e.g., risk-informed changes) are losing momentum.

## Timeliness

The average completion time for license amendment TACs is shown in Figure 3.2. The average completion time for the last two years (2004 and 2005 year to date) is above the period average of 9.0 months. For the years 2000-2004, the staff was able to maintain an average completion time of approximately 8 months. The evaluation team suspects that the increasing trend is partially caused by the flattening of the completion time profile shown in Figure 3-3. With the possible implementation of the recommendations in this report to improve program efficiency, the evaluation team believes that 8.5 months is a reasonable goal for FY2009 in that the staff would be asked to duplicate the declining trend achieved from 1999 to 2002. Intermediate goals would be established as necessary to get from the baseline (FY 06) to the goal of an 8.5 month average completion time.

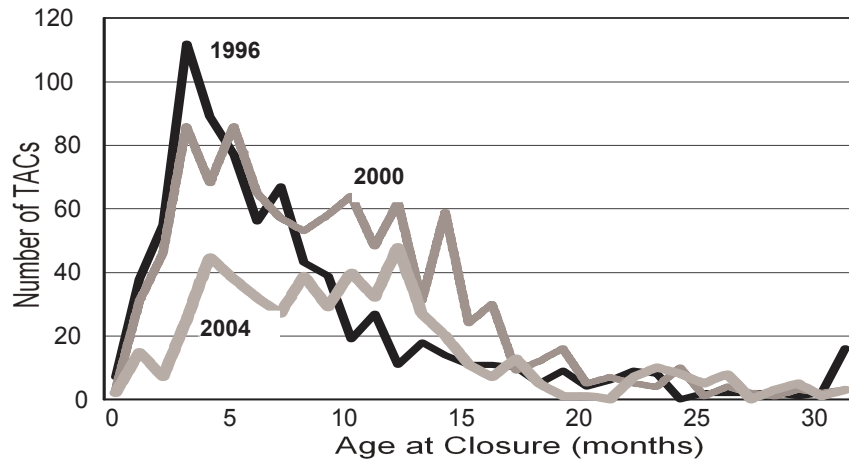
**Figure 3-2**



The age of the current inventory (as of July 2005) is presented in the Figure 3-4. As shown in the figure, there are several items challenging the current performance measure (actually exceeding the measure if not using an annual snapshot at end of FY). If the average completion time is adopted as a performance measure, more active and frequent program management (including intervention to resolve issues) would be recommended.

**Figure 3-3**

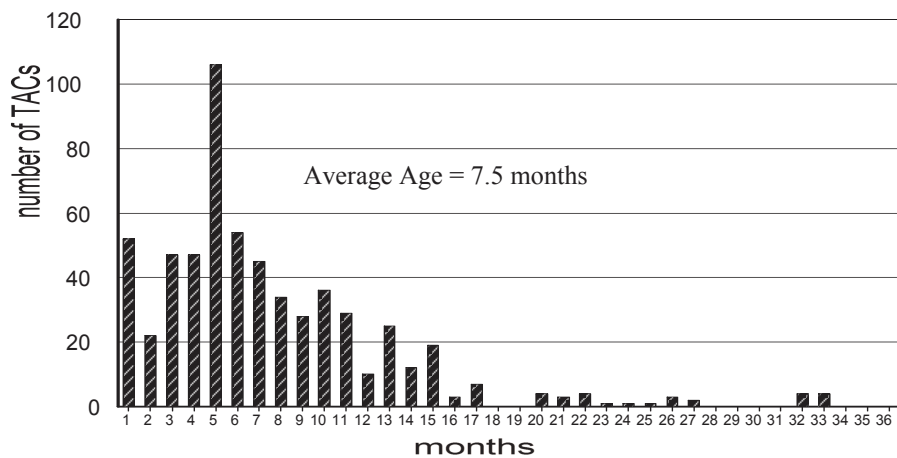
**License Amendments  
Age Distribution - 1996, 2000 & 2004**



**Figure 3-4**

**(As of July 2005)**

**Current Inventory Age**



The inventory of 25 items over 20 months old in July 2005 consists of:

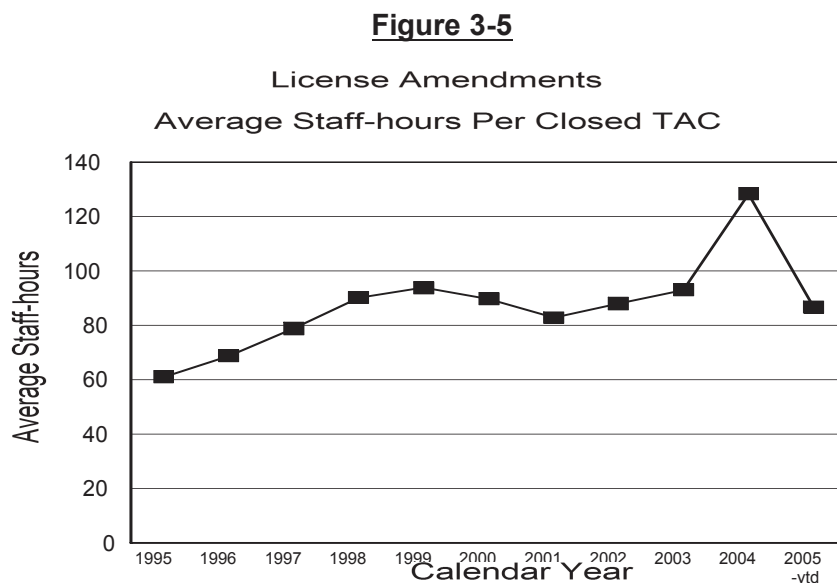
- < 9 related to alternate source term,
- < 6 related to coordination of amendments and topical reports/analytical methods,
- < 4 related to instrumentation setpoints (Method 3)
- < 4 miscellaneous, and
- < 2 related to control room habitability.

These items reinforce that the staff could improve performance in several areas. Similar concerns were also identified in stakeholder feedback such as the licensee survey performed by BNL and discussions with the industry's LATF. One area for improvement is for the agency to prepare and adhere to guidance documents for licensee's and the staff regarding specific types of applications.

Another significant concern expressed by stakeholders and reflected in the inventory of old and complex items is the occasional challenges the staff and industry encounter to resolve issues or appropriately channel issues into processes for generic resolution. Examples cited by stakeholders include control room habitability and certain instrumentation setpoints. The staff is currently working with the LATF to determine what process changes might be possible in this area.

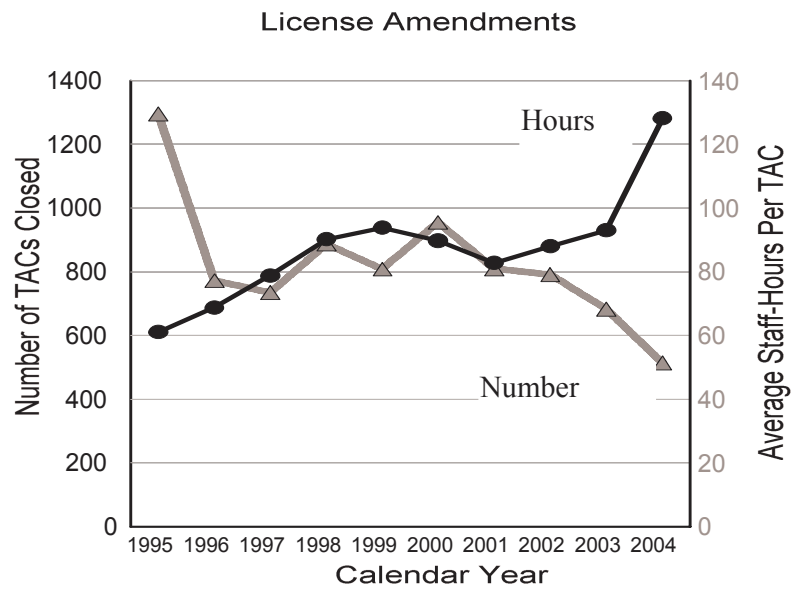
### Productivity

The average labor rate (total staff hours charged) per closed license amendment TAC is shown in Figure 3-5. The labor rate values do not include hours charged by licensing assistants, secretaries or management. The same data is shown in Figure 3.6 along with the data from Figure 3.1 on the number of license amendments closed. Figures 3.7 through 3.10 show the distribution of staff-hours charged to closed license amendment TAC numbers for several different calendar years.

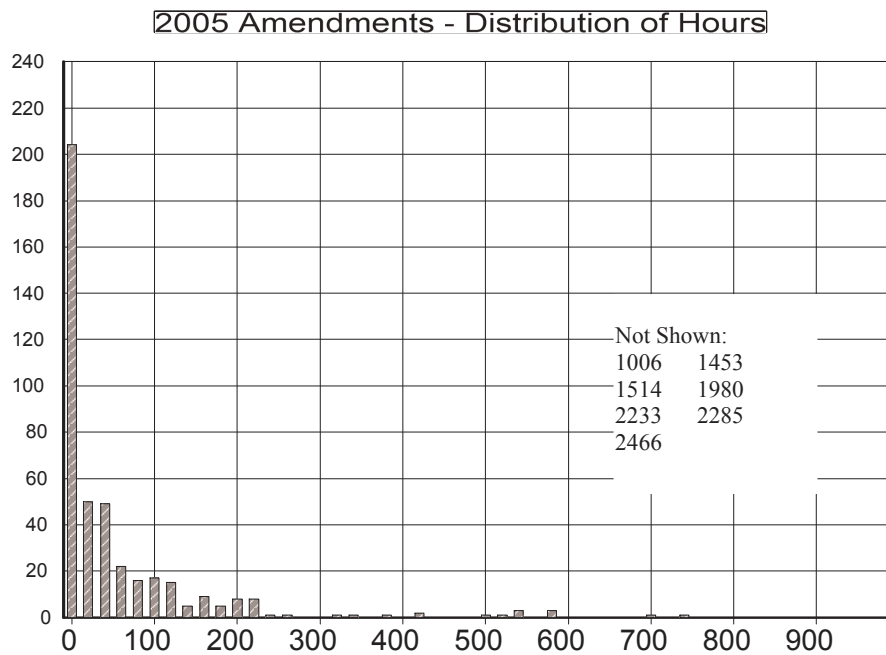




**Figure 3-6**

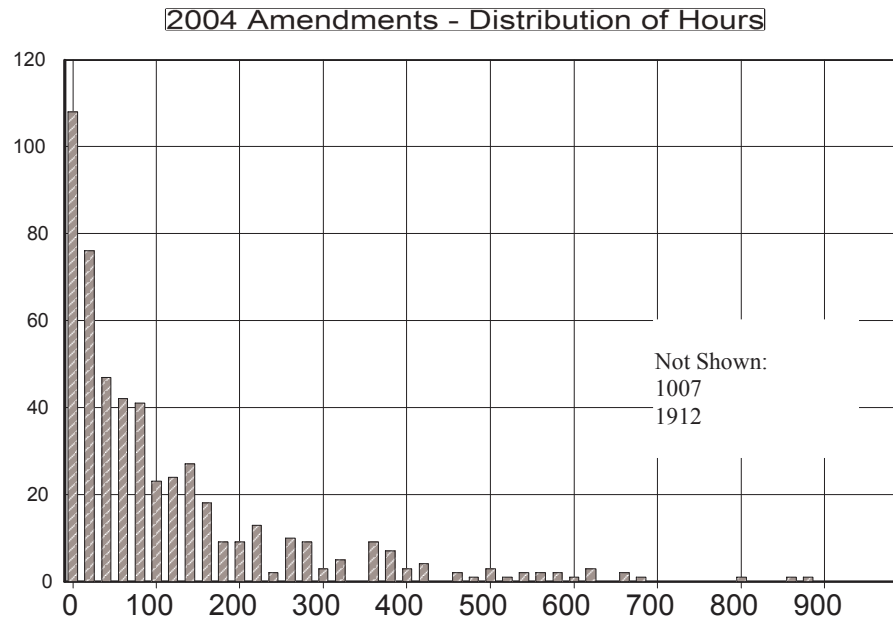


**Figure 3- 7**

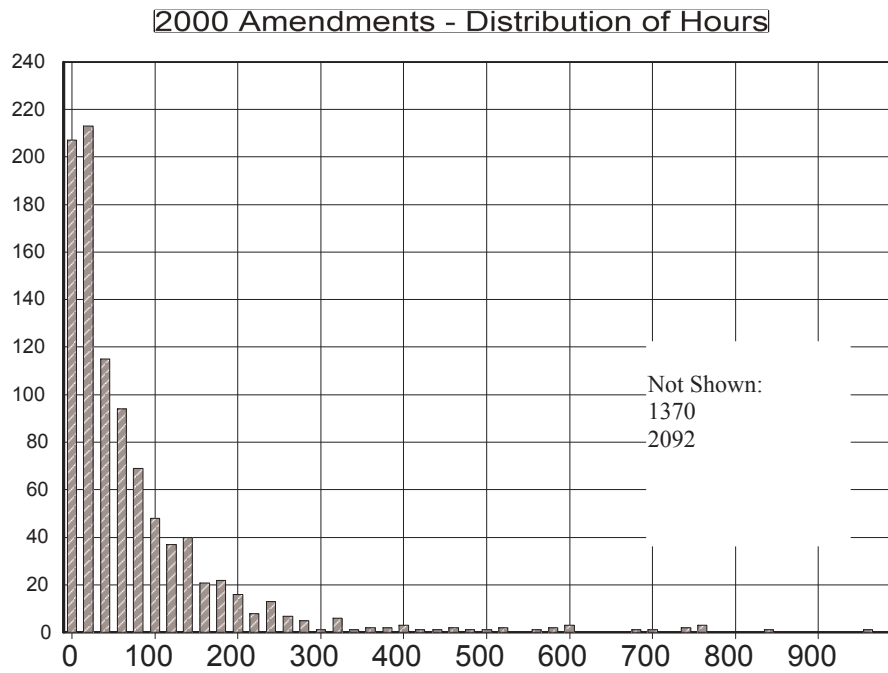


**Figure 3-8**

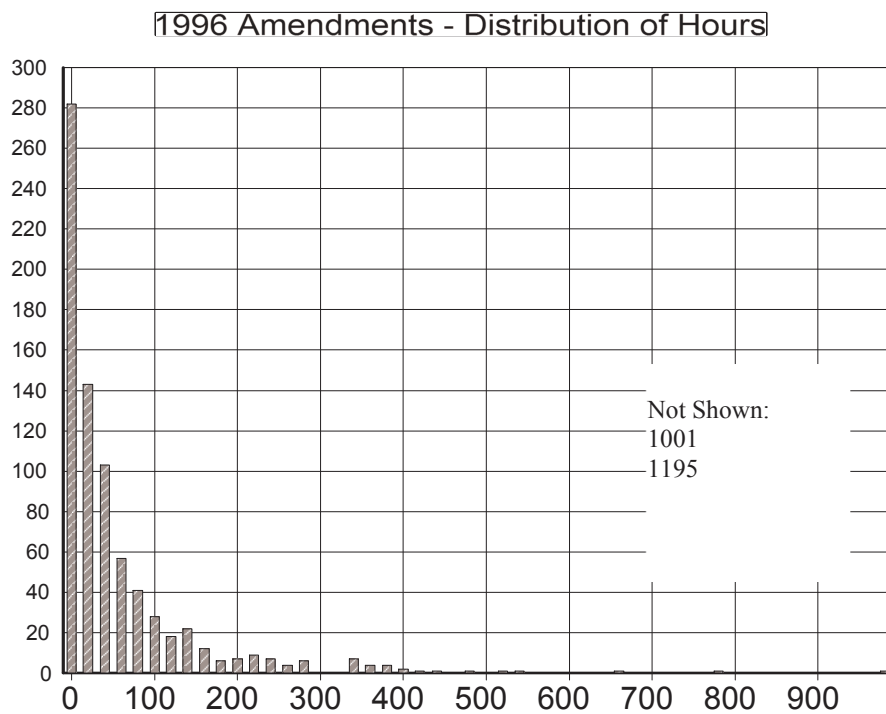
**As of July 2005**



**Figure 3-9**



**Figure 3-10**



The information displayed in Figures 3-8 through 3-11 shows that the majority of license amendments (by TAC) are consistently processed in less than 100 hours, with a significant fraction being closed using less than 20 hours. The evaluation team believes that the similar distributions for the various years supports a general recommendation to revise the current approach to planning and handling license amendment requests.

In general, the lower three quartiles (those TACs completed in less than 100 hours) should be considered routine and processed by the staff in the most efficient way possible (e.g., review by Project Managers, review by technical reviewers, combination). These applications generally involve single technical areas or have precedent amendments issued to one or more other licensees. The issues related to the scope and depth of the NRC review are more easily defined or have been established in precedent amendments. The current work planning process does not differentiate between applications and thus these routine amendments are widely distributed for characterization and planning input by various organizations. The evaluation team believes this adds unnecessary staff-hours and delay and that NRR should consider re-evaluating the work planning process. An alternative process for routine actions would combine features of the current process and those that preceded the NRR Work Planning Center (WPC). In such a process, the responsible NRR Project Manager would (with support from others as needed) characterize the amendment, propose an amendment-specific work plan, and coordinate the review, including requesting assistance and/or concurrences from appropriate technical branches. Information resulting from the coordination would be provided to the WPC for inclusion in databases and reports.

Those amendment requests (by TAC) that are likely to exceed 100 staff-hours (i.e., those in the upper quartile), should receive more attention than currently given by the staff and the licensees. The evaluation team recommends process and work planning changes for these amendments that increases the focus on communications, identification of appropriate scope and depth of review, and resolution of issues (i.e., better collaboration). Guidance should be revised to emphasize that expectations for such amendment requests include:

- < pre-application interactions (e.g., conference calls, meetings, draft submittals) between the staff and licensees. Discussions with staff and licensees indicate that such interactions are not being used consistently or to the degree warranted to prevent problems in the license amendment process.
- < routine post-application interactions (e.g., conference calls, meetings) including:
  - < initial discussions, as necessary, to ensure the staff understands the changes and background information supporting the application (this is different from subsequent discussions that might lead to supplemental submittals, unless an obvious deficiency is identified in the application).

- < routine discussions during the active phase of the staff's review (such discussions may be held simply to improve understanding of proposals or may be more directly linked to requests for additional information leading to supplemental submittals). For some complex amendment applications, the staff should consider setting up a web-based tool to interact with the licensee(s). This approach has shown promise in recent reviews of applications to convert to the improved standard TS.
- < requests for additional information (in accordance with existing practices) with additional emphasis in content, timeliness of licensee responses, and other improvements identified during an evaluation conducted by the NRC staff and industry's LATF.
- < discussions, as necessary, near the conclusion of the staff's review to ensure understanding and support finalization of staff's safety evaluation.

Based on discussions with staff and with licensees, another area requiring additional attention involves defining the appropriate scope and depth for staff reviews and the supporting information provided in licensees' applications. The scope of an application and related staff review deals with the various regulatory and safety issues associated with a proposed change. The staff continues to work with the LATF to improve how the scope (referred to as the regulatory evaluation section of an application and related NRC safety evaluation) is described in applications and safety evaluations. A greater issue and one that has a greater impact on the performance measures is the depth of an NRC review. The appropriate depth of an NRC review is defined as what is necessary to determine that the proposed change introduces no undue risk to the public health and safety. Some feedback from licensees and others is that on occasion the staff does not appropriately limit the depth of some reviews by taking full advantage of precedent reviews, the low safety-significance of a change, the evolution of the current licensing basis, and the existence of other regulatory requirements. Licensees should clearly lay out in their applications the relationships, soundness of the underlying references, precedents, etc., to support the staff's review. In other cases, the staff's review will need to assess underlying and perhaps well established references and existing licensing basis material to ensure that a proposed change presents no undue risk. Hopefully, the increased focus on these actions (including improved communications, coordination, and management attention) will enhance the efficiency and effectiveness of reviews.

The establishment of more challenging performance measures requires a more programmatic approach to managing license amendments. Additional or enhanced guidance for staff and licensees should reduce problems that ultimately adversely affect the performance measures such as timeliness and productivity. Cases where NRR has done well was through the implementation phase of generic changes (e.g., the 10 CFR 50.44 rulemaking). The process has worked well and demonstrates the value of developing and issuing guidance to licensees and the staff. The programmatic changes should address this problem by including additional procedures and emphasis on preparing and maintaining regulatory guidance documents and increased communications with industry. Industry organizations (e.g., LATF, TSTF) should also increase the attention paid to the implementation phase of generic changes by developing guidance for licensees and maintaining an infrastructure (e.g., a task force related to a specific rulemaking) to advise licensees and interact with the NRC staff during the plant-specific licensing phase.

### **3.3 RECOMMENDATIONS**

- (1) The expected number of amendments becomes a budget assumption. The number and type of amendments (i.e., routine, complex, power uprates, TS conversions) are estimated and used in budget process based on historical trends and surveys.
- (2) New Metrics - The following performance measures would be introduced without changing expectations regarding quality (safety) or public participation. The adoption of the proposed performance measures would require some additional monitoring tools, a communication plan, increased oversight of the overall licensing program, and enhanced participation by NRR management (including first-line supervisors).
  - (a) The average completion time of license amendments in FY06 (other than uprates and standard TS conversions, which have specific age goals) forms a baseline level from which a decreasing trend is established such that the average completion time at the end of FY09 is the lower of either 8.5 months or a 15% reduction from FY06 baseline.
  - (b) The average labor rate for license amendments in FY06 (other than uprates and standard TS conversions, which have specific labor rate targets), forms a baseline level from which a decreasing trend is established such that the average labor rate at the end of FY09 is the lower of either 80 hours (per assigned TAC number) or a 15% reduction from the FY06 baseline.

- (c) The completion time of all license amendment requests is less than 2 years. This is more restrictive than the current inventory age goal in that all actions are to be completed within 2 years (without reliance on the date the snapshot is taken). The inclusion of a firm backstop reinforces the need to resolve issues in a timely manner. To help resolve occasional problems with the staff's or a licensee's ability to meet an established schedule when the action is not needed by a specified date (e.g., refueling outage), the concept of a time hold is introduced.
- (3) Ensure that license amendments and foundational programs (topicals and TSTFs) are viewed as an integrated program. Resolve discrepancy between importance assigned to supporting and supported activities in order to encourage most efficient (e.g., generic) approaches.
- (4) Continue to reinforce a more programmatic treatment of license amendments as well as the overall licensing program. Revise the work flow to simplify the process and make it more efficient for routine, less complex amendment requests. Provide additional guidance in NRR office instructions on work flow, communications, coordination and other aspects of handling more difficult (upper quartile) amendment requests.
- (5) Continue to reinforce the importance of preparing, maintaining, and adhering to guidance documents (for staff and licensees) for initiatives that include license amendments as part of the implementation process. The existence of guidance documents or other standards also support efforts to improve staff's initial acceptance and characterization reviews for new license amendment applications.
- (6) Strengthen the process to resolve generic issues to minimize impact on license amendments. This possible process improvement is currently being discussed with the industry's LATF. Encourage licensees with multiple plants to use generic changes and joint submittals.

### 3a POWER UPRATES

#### **BACKGROUND**

Licensees have been applying for and implementing power uprates since the 1970s as a way to increase the power output of their plants. The NRC staff reviewed and approved 105 power uprate applications to date. Maintaining safety remains the staff's highest priority in reviewing power uprate applications and the staff intends to ensure that safety is maintained.

Approximately 13,250 megawatts-thermal (MWt) or 4,417 megawatts-electric (MWe) has been added to the Nation's electric generating capacity or an equivalent of about four nuclear power plant units through implementation of power uprates at existing plants. The NRC staff currently has 12 plant-specific power uprate applications under review and anticipates that licensees will plan to request power uprates for 20 nuclear power plant units over the next 5 years. If approved, these power uprates will result in an increase of about 4,368 MWt (1,456 MWe).

Power uprates are categorized according to power increases and the methods used to achieve the increase. A measurement uncertainty recapture (MUR) power uprate results in a power level increase that is less than 2 percent and is achieved by implementing advanced techniques for calculating reactor power. Stretch power uprates (SPUs) usually result in power level increases that are up to 7 percent and generally do not involve major plant modifications. Extended power uprates (EPUs) result in larger power level increases than SPUs and usually require significant modifications to major plant equipment.

Additional information regarding recent developments and the status of the Power Uprates program is located in SECY-05-0098 (ML051300502; dated June 2, 2005), and SECY-04-0104 (ML041390575; dated June 24, 2004).

#### **PERFORMANCE EVALUATION CRITERIA**

The staff has established performance duration goals of 6 months and 960 staff-hours for reviewing MUR power uprate applications, 9 months and 1800 staff-hours for reviewing SPU applications, and 12 months and 3900 staff-hours for reviewing EPU applications. The staff will continue to ensure that the goal of maintaining safety is not compromised in order to meet these timeliness and resource expenditure goals.

The timeliness and resource expenditure goals assume that licensees' submittals are consistent with established guidelines; that licensees' submittals do not include other non-power uprate related requests; that licensees' submittals do not result in substantive requests for additional information (RAIs); and that licensees respond to RAIs within established schedules. In establishing the above goals, the staff recognized that in some cases, licensees' plans for implementing power uprates are more flexible than the timeliness goals described above. As a result, the staff can meet its timeliness goals by either completing the reviews according to the numerical goals or by completing the reviews in time to support licensees' proposed implementation schedules, whichever is longer. This flexibility allows the staff to utilize its resources to better support other high-priority activities.



## **GUIDANCE AND STAFF PERFORMANCE**

While the process for requesting and approving a change to a plant's power level is governed by 10 CFR 50.90, 50.91, and 50.92, guidance was developed to enhance the effectiveness and efficiency of the power uprate application and review process. Specifically, Regulatory Information Summary (RIS) 2002-03, "Guidance on the Content of Measurement Uncertainty Recapture Power Uprate Applications," and Review Standard (RS)-001, "Review Standard for Extended Power Uprates," were issued on January 31, 2002, and December 2003, respectively. Currently, there is no guidance specifically written for SPUs.

RIS 2002-03 was issued to provide guidance to licensees on the scope and detail of the information that should be provided to NRC for reviewing MUR power uprate applications. As shown in the following table, MUR applications received after the issuance of RIS 2002-03 are, on average, being completed 7% faster with 18% less staff-hours expended than those received prior to issuance. The average staff-hours used are usually being maintained below the aforementioned target performance criteria of 960 hours. While the internal staff goal of completing an MUR in 6 months is still being exceeded on average, the reviews have been completed by the licensee's "need" date. Nevertheless, it must be emphasized that these time estimates are for applications that reflect the use of approved flow measurement devices and do not include other requests or changes. These data seem to indicate that the guidance of RIS 2002-03 is effectively establishing the proper level of content in the submittals necessary for an efficient review. With the staff's anticipation of 5 MUR applications in fiscal year 2006, it appears that RIS 2002-03 is providing good clarity in submittal requirements.

Measurement Uncertainty Recapture (MUR)	Average FTE Used	Average Staff Hours	Average Review Duration (Months)
Application before RIS 2002-03	0.78	1139	7.89
Application after RIS 2002-03	0.64	934	7.32

Endorsed by the ACRS as an "excellent review standard," RS-001, a joint effort by all divisions within NRR, was issued as a first-of-a-kind document that establishes standardized review guidance and acceptance criteria for the staff's review of EPU applications to enhance the consistency, quality, and completeness of reviews. It serves as a tool for the staff's use when processing EPU applications in that it provides detailed references to various NRC documents containing information related to the specific areas of review. By informing licensees of the guidance documents the staff will use when reviewing EPU applications, RS-001 aids licensees in preparing EPU applications that address those topics necessary for a complete application. This is cited by the team as a best practice that NRR should consider for other licensing program elements.

Since its issuance, RS-001 has been employed in the review of six EPU applications (Vermont Yankee, Waterford, Browns Ferry 1, Browns Ferry 2 & 3, Beaver Valley 1 & 2, and Ginna). For the Vermont Yankee (approximately 6000 hours), currently under review, and Waterford

(approximately 7400 hours) EPU reviews, the staff has exceeded the hourly goals (3900 hours) for the reviews. The key reason the staff exceeded the hourly goals is the quality of the power uprate applications. The applications lacked sufficient technical information to allow the staff to decide that safe plant operation will continue after the proposed power uprate is implemented. The staff had to request additional information from the licensees resulting in several supplements to the original applications.

In summary, in all cases (MURs, SPUs, EPUs), the staff has always met its timeliness goal. However, improvements can be made to the hourly goal and this subject will be addressed in the next section.

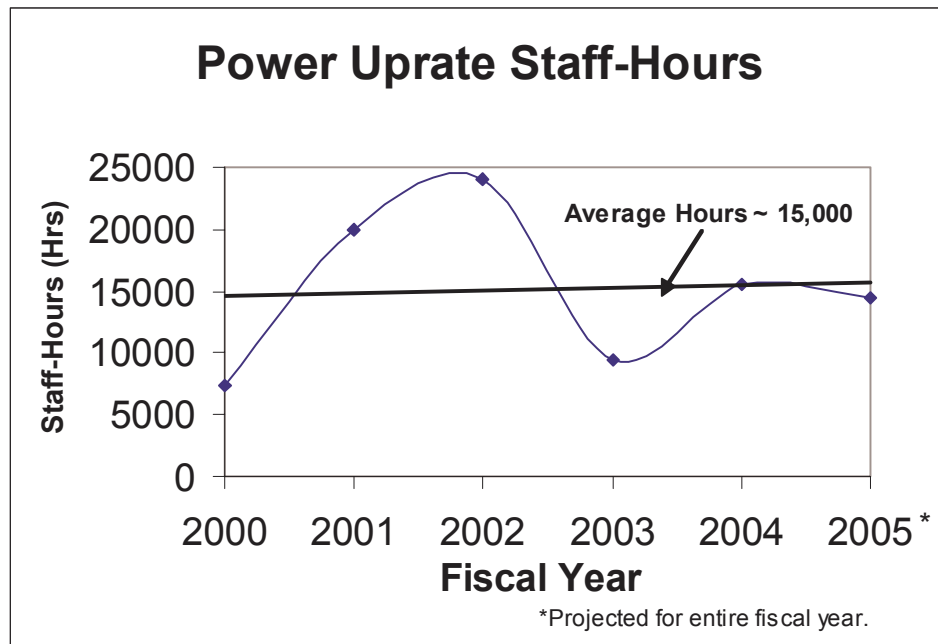
### **RECOMMENDATIONS:**

To address the hourly goal issue, the staff is using the Office of Nuclear Reactor Regulation (NRR) Work Planning Center (WPC) to aid in the controlling and monitoring of all power uprate applications. Currently, the staff is developing guidance to provide project managers a comprehensive set of directions for processing a power uprate license amendment. The guidance will emphasize the need for pre-application interactions (e.g., meetings, review of draft submittals, etc.) of each power uprate starting approximately one year before the power uprate application is to be submitted. This will initiate a dialogue between the staff and the licensee to ensure that sufficient technical information is included in each application and to identify any emergent technical issues that may cause significant slippage in the review schedule. Issues beyond the scope of the power uprate application should also be identified and addressed appropriately. The guidance will also focus on a timely and thorough acceptance review of each power uprate application.

As experience is gained through the implementation of RS-001, the staff will continue to perform lessons learned reviews. One lesson learned is that there is a decrease in resource expenditure when experienced reviewers are used. However, the training of new reviewers is a necessary cost of doing business. It is recommended that the hourly goal be re-evaluated for possible adjustment to reflect some training hours.

To ensure that there is sufficient time to produce a quality product to licensees, it is necessary to continue to collect proper resource expenditures to enable the proper scheduling of efforts in the future. As illustrated in the following figure, the staff-hours expended on power uprates fluctuated significantly from approximately 7500 hours in fiscal year (FY) 2000 to more than triple in FY2002 with an average staff workload of approximately 15000 hours. The consistency, in terms of staff-hours, of the power uprate program has improved in FY2004 and FY2005 (using projected hours). However, the staff anticipates 7 power uprate applications (5 MURs, 2 EPUs) in FY2006, 3 in 2007 (1 SPU, 2 EPUs), but only one EPU in FY2008. Proper planning to ensure a steady staff workload is necessary for consistency in the management of the power uprate program.

**Figure 3-12**

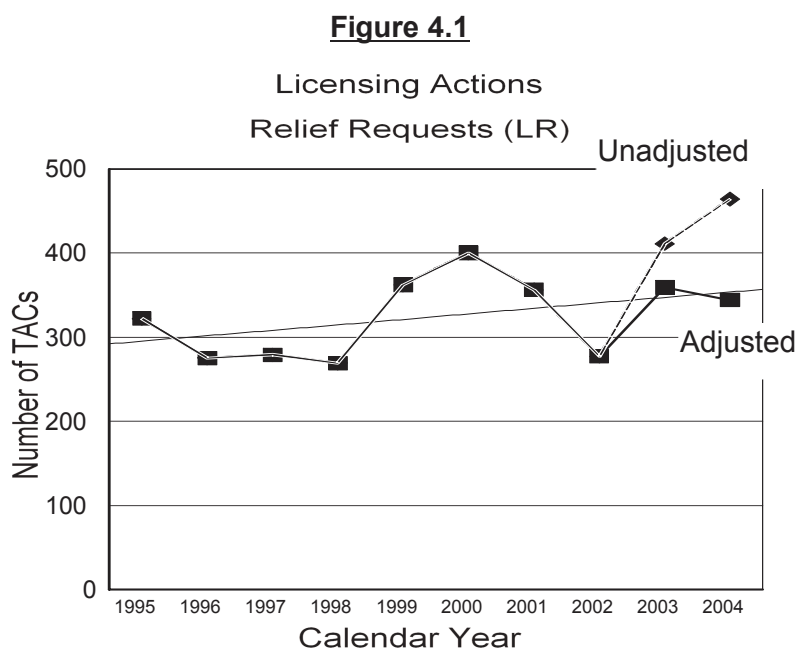


## 4.0 RELIEF REQUESTS

### 4.1 BACKGROUND

In 10 CFR 50.55a, the NRC incorporated into its regulations certain industry codes and standards. The most significant of the industry codes and standards addressed by the rule is the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (the Code). To address various plant-specific conditions, the NRC sometimes grants a licensee relief from the Code or approves an alternative proposed by a licensee. These licensing actions are generally referred to as relief requests.

The number of relief requests (by assigned TAC numbers) issued for each of the last 10 calendar years is shown below.



In 2003, the NRC revised its counting of relief requests. Prior to 2003, the standard practice for counting the number of relief requests was similar to the practice used for license amendments. That is, for each incoming request and expected outgoing action, one TAC number was assigned for each unit (docket number) addressed in the application. Applications include requests for relief from one or more provisions of the Code. Starting in 2003, the NRC changed its practice and began assigning one TAC number per docket for each specific request for relief within an application. The data labeled unadjusted in Figure 4.1 reflect this change in counting practice (these data have been included in NRC reports and in computation of total number of licensing actions completed). The data labeled adjusted are the evaluation team's estimate of the numbers assuming the counting practices had not changed in 2003.

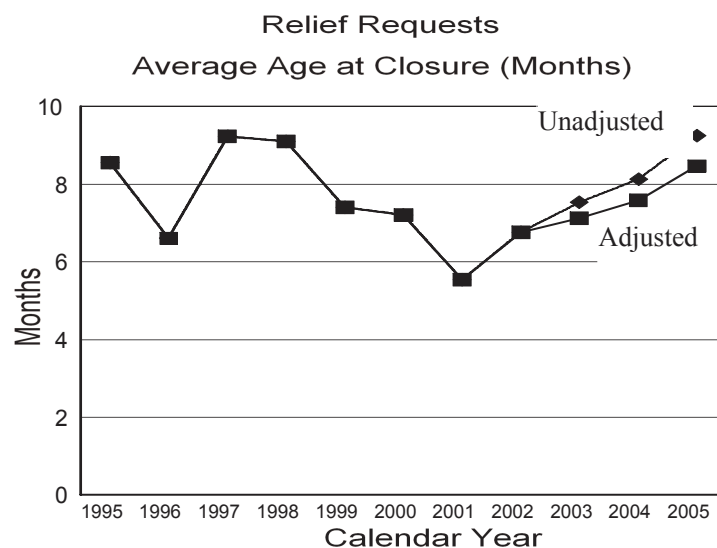
## 4.2 DISCUSSION

Using the adjusted data for recent years, the average number of relief requests issued over the period is approximately 340 per year.

### Timeliness

The average completion time for relief request TACs is shown in Figure 4.2. As with license amendments, the trend for the last several years has been an increasing average completion time. The age profile for several years is shown in Figures 4-3, 4-4, and 4-5.

**Figure 4-2**



Based on a cursory review, it appears the change in counting added to the increase in average age at closure for 2004 and 2005 since the majority of items in this category exceeded the historical average of 8 months to complete.

Figure 4-3

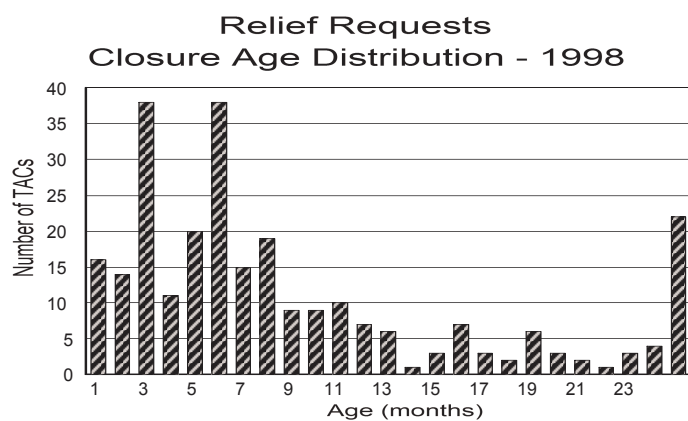


Figure 4-4

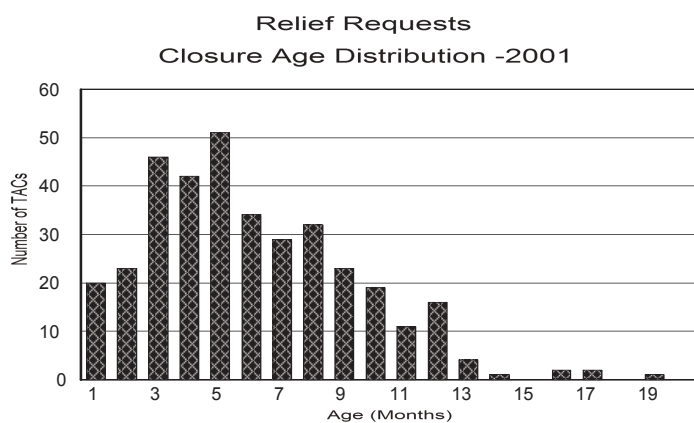
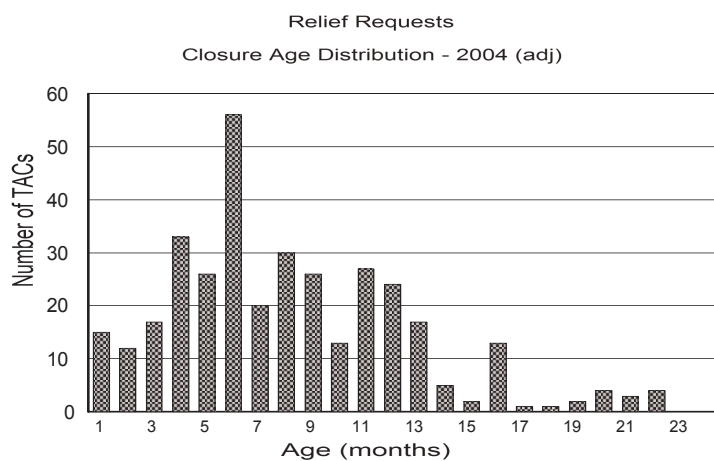
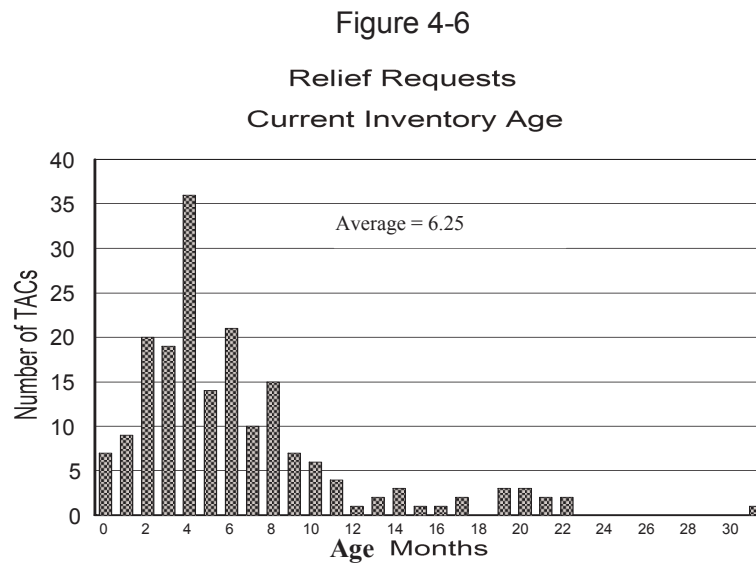


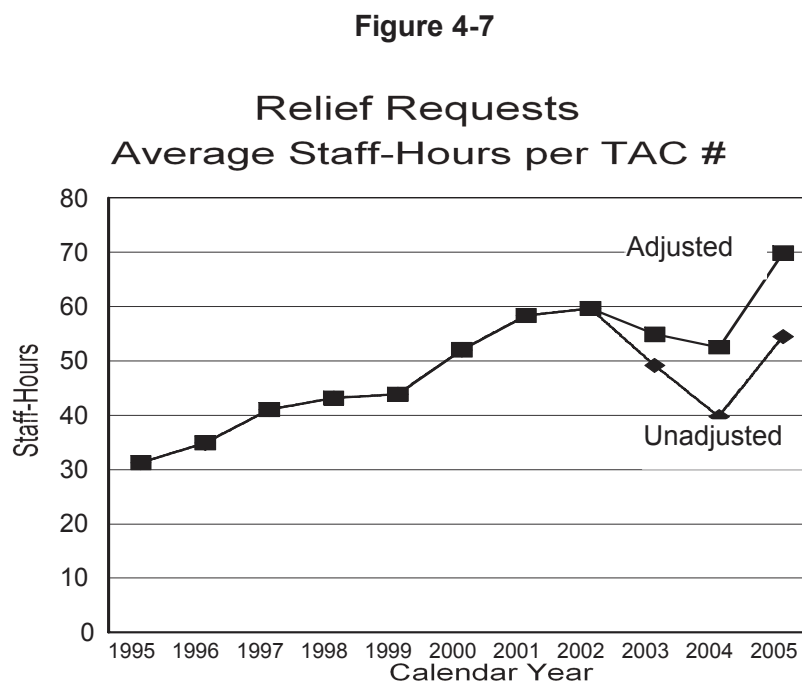
Figure 4-5



The age profile of the current inventory (July 2005) is shown in Figure 4-6.

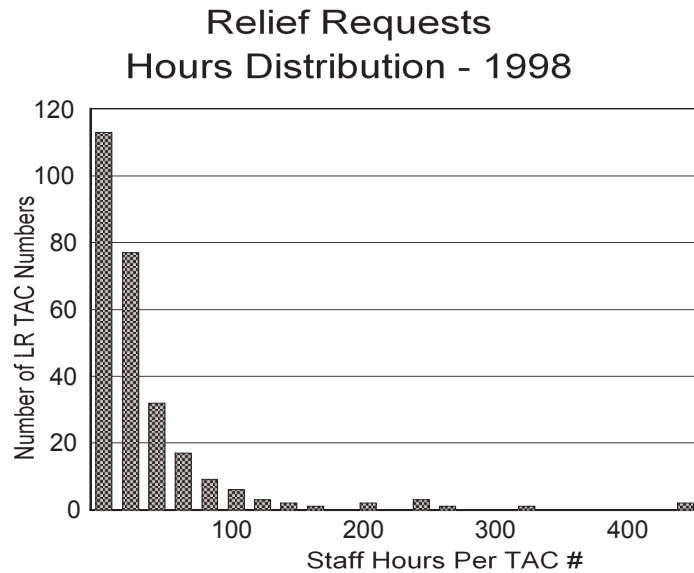


The average staff-hours per completed relief request TAC is shown in Figure 4-7.

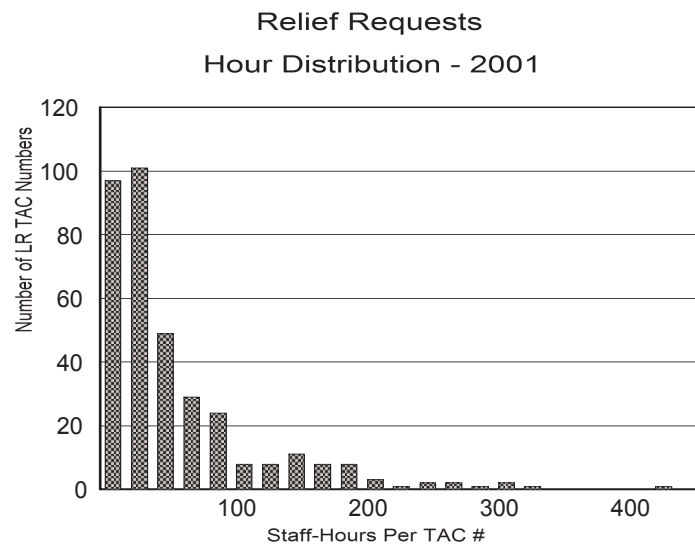


The staff-hours distribution of closed relief request TACs for two different years are shown in Figures 4-8 and 4-9.

**Figure 4-8**



**Figure 4-9**





The change in accounting in 2003 complicates the analysis of recent trends. As discussed later, the evaluation team recommends returning to the traditional way of tracking and counting relief requests consistent with other license amendments.

There has been some feedback from licensees regarding the handling of relief requests and possible ways to improve the efficiency of the process. Much of the discussion has involved adoption of ASME Code Cases and desire by licensees for the processes to be faster and possibly eliminating the need for some plant-specific relief requests. The NRC has improved by more frequently issuing its lists of approved code cases (e.g, Regulatory Guides 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1, and Regulatory Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code,"). This has addressed at least some of the problems identified by the licensees. The staff and the LATF are continuing to discuss other possible improvements to the licensees' requests for and staff's review of relief requests.

An additional challenge in the area of relief requests is the continuing identification of various materials issues (e.g., primary water stress corrosion cracking). These issues tend to cause the numbers and types of relief requests to vary. In cases such as the reactor vessel head inspections, much of the work also involved the review of new or evolving technologies and analytical models. The evaluation team believes that such recent issues partially explain the increasing average staff-hours charged to relief requests. The team considered the introduction of performance measures similar to license amendments (average completion time and labor rates) but recommends that a less dramatic change be implemented in the short term. When the materials programs stabilize, the agency should assess how the new measures have worked with license amendments and possibly adopt a similar approach for relief requests.

Unlike license amendments that can deal with many technical areas, the processing of relief requests remains largely within several technical sections in NRR. The evaluation team believes the narrower scope of reviews and the easier identification of responsible staff related to relief requests supports the use of the work flow process recommended for routine license amendments.

### 4.3 RECOMMENDATIONS

- (1) Make the expected number of relief requests a budget assumption. NRR should go back to the historical practice of using one TAC number per docket per application and/or outgoing issuance.
- (2) Relief requests should also be treated in a more programmatic manner. The evaluation team recommends that the work flow for relief requests be the same as proposed for routine license amendments to simplify the process and make it more efficient.
- (3) New Metrics - The following performance measures would be introduced without changing expectations regarding quality (safety) or public participation . The adoption of the proposed performance measures would require some additional monitoring tools, a communication plan, and an increased oversight of the overall licensing program. The comparison of performance against this measure would include relief requests and also other licensing actions except for license amendments. Future improvements in performance could be encouraged by making the percentages more aggressive or adopting metrics similar to those recommended for license amendments.
  - < The completion time of 96% of licensing actions is less than 1 year and 100% is less than 2 years. This is more restrictive than the current inventory age goal (does not rely on date snapshot is taken). To help resolve the occasional problems with the staff's or a licensee's ability to meet an established schedule when the action is not needed by a specified date (e.g., refueling outage), the concept of a time hold is introduced.

## 5.0 ORDERS

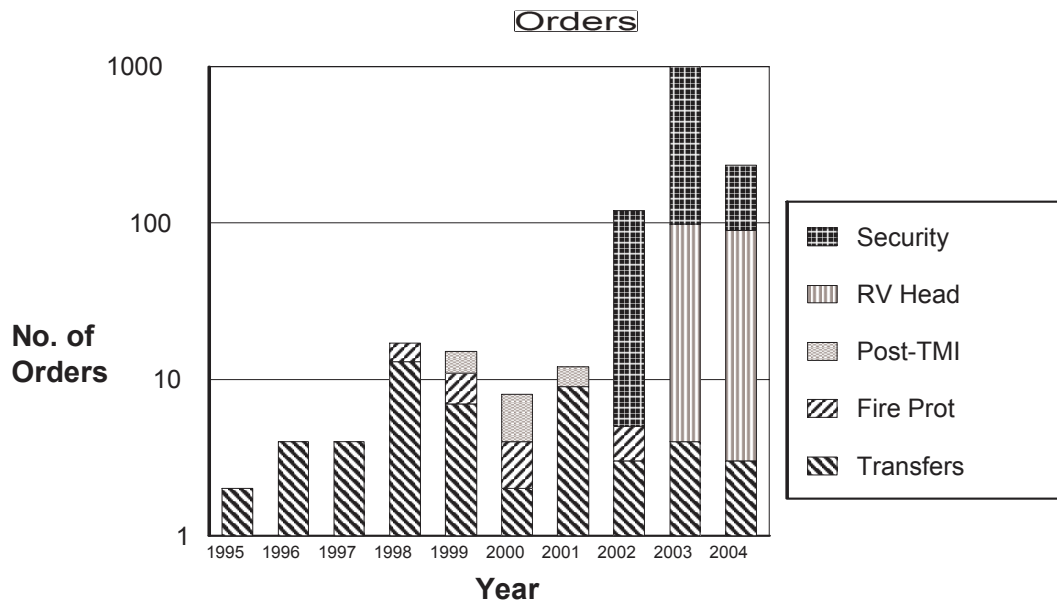
### 5.1 BACKGROUND

As shown in Table 5.1, there are several types of orders that the NRC has issued to power reactor licensees. Other types of orders might be issued as part of enforcement actions or to individuals.

Table 5.1	
Type	Example
New generic requirements imposed on multiple plants	Security and Reactor Vessel Head Inspections
New requirements imposed on specific plant (usually confirmatory)	Maine Yankee, Millstone
Revise requirements in previous Order	Time extended to establish containment hydrogen monitoring
Administrative	License Transfers

The number (logarithmic scale) of orders issued by topical area and calendar year is shown in the figure below.

**Figure 5-1**



The large increase in orders in recent years results from their use to impose new security-related requirements following the events of September 11, 2001. In addition, approximately 70 orders were issued in both 2003 and 2004 to impose new inspection requirements for reactor vessel head penetrations at pressured water reactors. Before 2002, only a few orders were issued in a typical year, with most of these being related to license transfers.

The average-staff hours charged to the various types of orders issued by the NRC to power reactor licensees is provided in Table 5.2.

Table 5-2 Labor Rates for Various Sets of Orders	
Order Category	Average Hours Per TAC
license transfers	60
fire protection (e.g., confirming resolution of thermolag issues)	12
Post-TMI (e.g., revising hydrogen monitoring requirements)	26
Security	3
Reactor Vessel Head	0.7
Relief from RV Head*	91.5
* initial requests for alternatives, subsequently treated as relief requests (LR)	

## 5.2 DISCUSSION

The evaluation team notes significant differences between the orders issued without licensee applications (e.g., security and reactor vessel head) and those issued in response to licensee requests (e.g., post-TMI and license transfers). A major difference is that the NRC-directed orders relate directly to the agency's safety mission while licensee-requested orders are more like other licensing actions (amendments and reliefs) and relate to the "enabling goals." Another difference is that most of the NRC staff-work for orders imposing generic safety requirements is in preparing and issuing the orders (usually tracked under a single TAC number). As reflected in the labor rates shown above, the plant-specific activities for the NRC-initiated orders often involve little more than confirming the licensees' responses and the administrative processing time.

The low number of orders issued in response to licensees' requests (e.g., to relax a post-TMI requirement) may not warrant a separate measure and may be grouped with relief requests in terms of performance measures (i.e., included in the population for which 96% would be completed within 1 year and 100% would be completed within 2 years). For generic safety orders initiated by the NRC, plant-specific TAC numbers should be assigned only if it is expected that sufficient hours will be charged to each TAC to warrant the administrative costs of using the work-tracking system. In either case, the issuance of the orders and the closing of plant-specific TAC numbers, if issued, should be assessed against performance measures related to the safety and security performance goals.

### 5.3 **RECOMMENDATIONS**

- (1) The expected number of licensee-requested orders becomes a budget assumption.
- (2) Orders should be considered within the more programmatic treatment of licensing actions. For planning and budgeting purposes, NRR should improve monitoring of what orders might be requested. For generic safety orders, revise the work flow to simplify process and make it more efficient.
- (3) NRC-generated orders such as those related to security reactor vessel head inspections should be evaluated under the safety, security, and other performance measures apart from those primarily related to the efficiency of the licensing program.
- (4) New Metrics - The following performance measures would be introduced without changing expectations regarding quality (safety) or public participation. The adoption of the proposed performance measures would require some additional monitoring tools, a communication plan, and increased oversight of the overall licensing program. The comparison of performance against this measure would include orders and also other licensing actions except for license amendments.
  - < The performance goals should be to complete 96% of actions in less than 1 year and 100% of actions completed in less than 2 years. This is more restrictive than the current inventory age goal (does not rely on date snapshot is taken). To help resolve the occasional problems with the staff's or a licensee's ability to meet an established schedule when the action is not needed by a specified date (e.g., refueling outage), the concept of a time hold is introduced.

## 6.0 Other Activity Types

Although not specifically included in the initial discussion of this program evaluation, the team performed some limited reviews of other types of licensing actions. These include exemptions (LE), program reviews (LQ), and the category of “other,” (LL). The team evaluated these actions, in part, to determine if any warranted a specific metric or if they would be adequately addressed by the recommended programmatic improvements and revised performance measure for completion of 96% of actions within 1 year and 100% of actions within 2 years.

### 6.1. EXEMPTIONS

Requests for exemptions from NRC regulations related to commercial nuclear power plants are made by licensees and processed by the NRC staff in accordance with 10 CFR 50.12, “Specific exemptions” (or similar regulations in other parts of 10 CFR). The number of exemptions (by TAC number) by calendar year is provided in Figure 6-1.

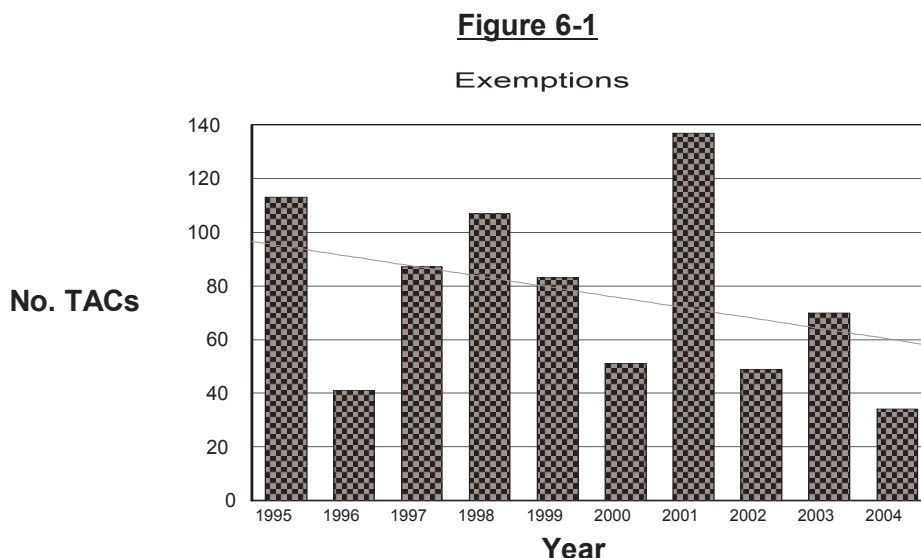
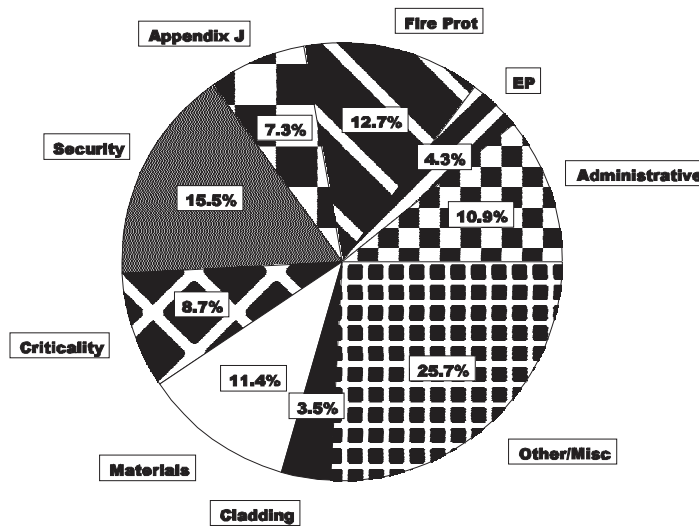


Figure 6-2 shows the breakdown by subject area of exemptions issued during this period. Some of the larger sets of exemptions include:

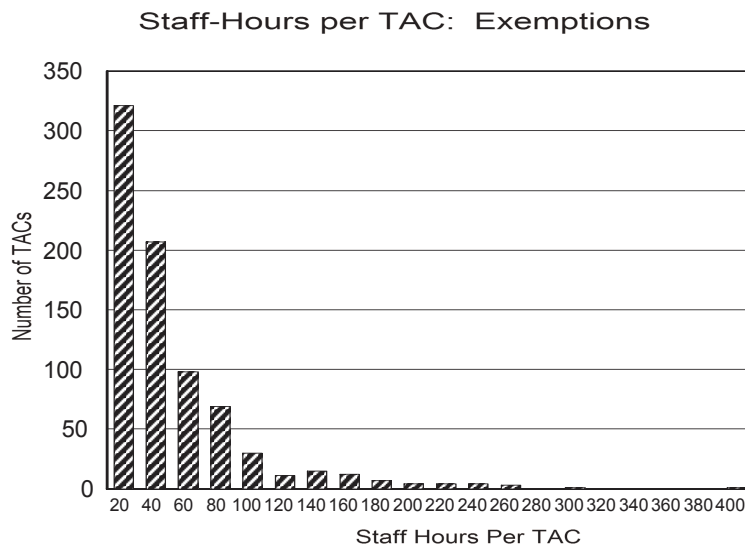
- < the introduction of hand geometry biometrics system (10 CFR 73.55)
- < criticality monitoring (10 CFR 70.24)
- < fire protection (10 CFR Appendix R)
- < containment leak rate testing (10 CFR Appendix J)
- < use of ASME code case for pressure/temperature limits (10 CFR Appendix G)
- < schedule for final safety analysis report updates (10 CFR 50.71)

**Figure 6-2**



As discussed above, the majority of the exemptions requested deal with a relatively small number of issues. Licensees were generally able to propose an alternative to the existing regulation and the exemption was issued to many licensees before a related rulemaking could be completed. This is also reflected in the distribution of staff-hours charged to exemption-related TACs that is shown in Figure 6-3. The average staff-hours per exemption-TAC during the period is 39.3 hours.

**Figure 6-3**



The above data does not include lead plant exemptions for major initiatives (South Texas: risk-informed/special treatment, Comanche Peak: Risk-informed IST, Grand Gulf: Appendix J, and San Onofre: combustible gas control). The evaluation team believes that the processing of such lead plant exemptions that precede rulemakings or other changes are best addressed through individual action plans, including defined milestones and performance measures.

In many cases, it is difficult to foresee an influx of similar exemptions from multiple plants until the problem or conditions actually arise. The staff should acknowledge and plan for such an influx once it is recognized that multiple exemptions are likely. The exemptions could be part of an overall plan to address an issue once it is recognized that a large number of licensees are in noncompliance with a regulation and relief is warranted or following other developments such as the code-case or biometrics exemptions. In most cases, these types of exemptions can make good use of the precedent exemptions, are easy to process, and do not significantly tax staff resources. Recognizing and making adjustments for similar exemptions requests from multiple licensees should be part of the program management for operating reactor licensing.

Removing the special cases and similar exemptions to multiple licensees, the exemption subgroup of licensing actions consists of about 40 TACs per year with an average labor rate of 65 staff-hours for each TAC.

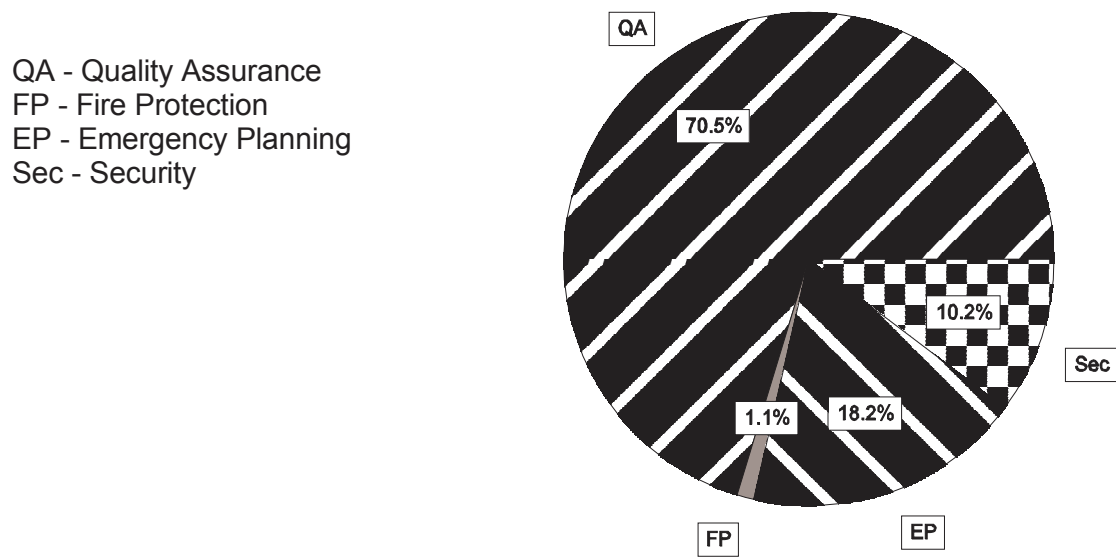
Routine exemptions would be included in the performance measure of completing 96% of licensing actions in less than 1 year and 100% in less than 2 years. To help resolve the occasional problems with the staff's or a licensee's ability to meet an established schedule when the action is not needed by a specified date (e.g., refueling outage), the concept of a time hold is introduced. Given that routine exemptions have been narrowly focused to specific issues, the evaluation team recommends the streamlined work flow process (same as routine amendments) be used. Exemptions related directly to initiatives preceding rulemakings would use specific action plans and agency performance would be assessed against the goals of the action plan.

## **6.2 PROGRAM REVIEWS**

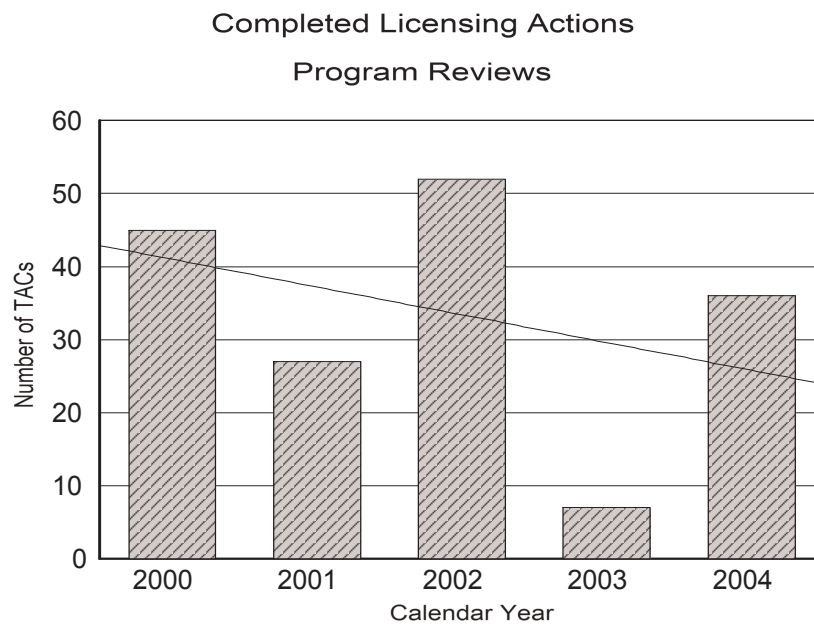
Another type of licensing action involves the NRC review and approval of licensee programs such as quality assurance, emergency planning, security, and fire protection. Figure 6.4 shows the makeup of the program review category (activity type LQ) for the last 5 calendar years. Figure 6-5 provides the number of LQ TAC numbers closed for each calendar year since 2000. The distribution of staff-hours charged per closed LQ-TAC is provided in Figure 6-6.



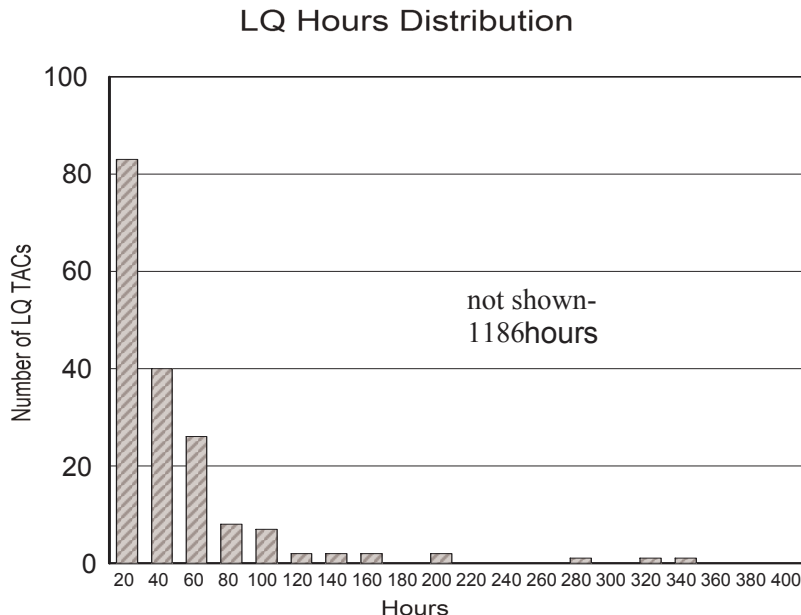
**Figure 6-4**



**Figure 6-5**



**Figure 6-6**



For the last 5 years, LQ TACs have been completed in an average of 8 months and have taken an average of 41 staff-hours per TAC number.

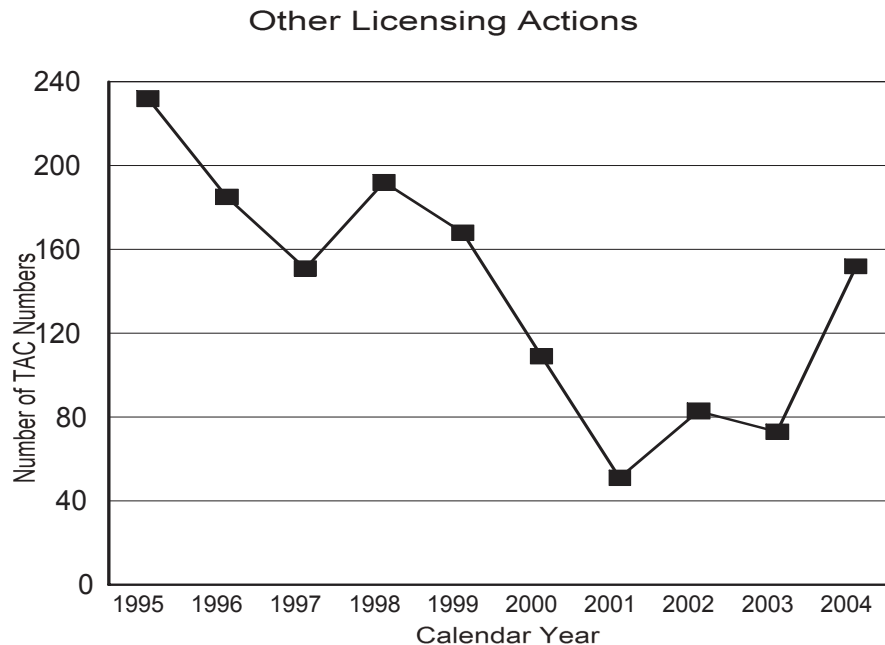
The program reviews vary by both program, the extent of proposed changes, and the number processed per year. For example, although Figure 6-4 shows many QA reviews, the current LQ-inventory consists primarily of emergency planning program changes (following revised guidance on emergency action levels). There have been some recent submittals related to quality assurance programs and emergency planning programs involving large number of nuclear units per application (so-called fleet submittals). These submittals involve the adoption of common programs by multiple sites operated by the same licensee. The above data should be used as part of the broader program management in terms of predicting work loads and allocating resources.

Program reviews would be included in the performance measure of completing 96% of licensing actions in less than 1 year and 100% in less than 2 years. To help resolve the occasional problems with the staff's or a licensee's ability to meet an established schedule when the action is not needed by a specified date (e.g., refueling outage), the concept of a time hold is introduced. Given that program reviews are narrowly focused to specific issues and corresponding NRR sections, the evaluation team recommends the streamlined work flow process (same as routine amendments) be used.

### 6.3 OTHER (LL)

The last type of licensing action included in this evaluation is the category of other (activity type LL). The number of LL-TAC numbers per calendar year is provided in Figure 6-7.

**Figure 6-7**



The decrease in the numbers from 1999 through 2001 are thought to be due to the success of a TAC discipline project in that time frame. It appears that the miscoding of LL-TACs remains fairly common and it would be appropriate to re-emphasize the importance of properly entering the data into requests for creating a TAC number. For example, a cursory review of the 2003 data led the evaluation team to conclude that approximately 5 of the TACs were not licensing actions (should have been other licensing tasks), 3 of the TACs should not have been assigned a TAC number but were instead a sub-task of a licensing action, and 26 of the TACs should have been coded as relief requests or program reviews.

The increase in 2004 is due largely to opening a large number of security-related (encryption software) TACs under the LL activity type. As found in the evaluation of orders, the vast majority of the security-related TACs were closed with less than 1 hour charged to the TAC.

Other licensing actions would be included in the performance measure of completing 96% of licensing actions in less than 1 year and 100% in less than 2 years. To help resolve the occasional problems with the staff's or a licensee's ability to meet an established schedule when the action is not needed by a specified date (e.g., refueling outage), the concept of a time hold is introduced. Given that other licensing tasks have been narrowly focused to specific issues and corresponding NRR sections, the evaluation team recommends the streamlined work flow process (same as routine amendments) be used.

#### **6.4    RECOMMENDATIONS**

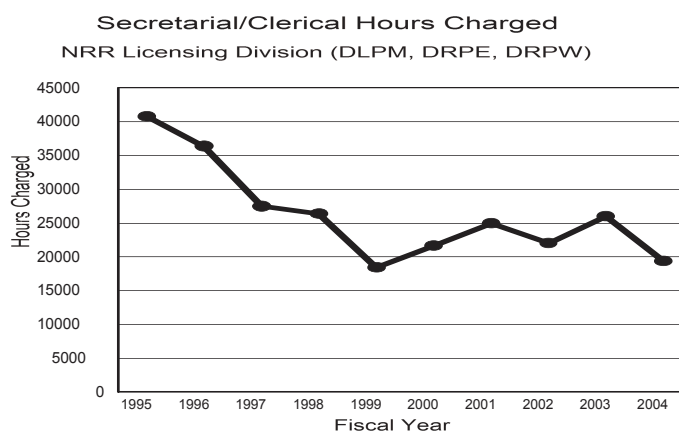
- (1)    Action plans should be used for lead plant exemptions that precede rulemakings.
- (2)    Exemptions that are similar and submitted from various licensees should be processed using plans that utilize precedents to improve efficiency.
- (3)    Program reviews and other licensing tasks should be processed using a streamlined work flow (same as routine amendments).

## 7.0 SUPPORTING ACTIVITIES

In addition to the efforts by project managers and technical reviewers on individual licensing actions, the NRC staff spends some resources for activities that directly or indirectly support the licensing program. These include secretarial support, management, licensing assistants, project management, and program management.

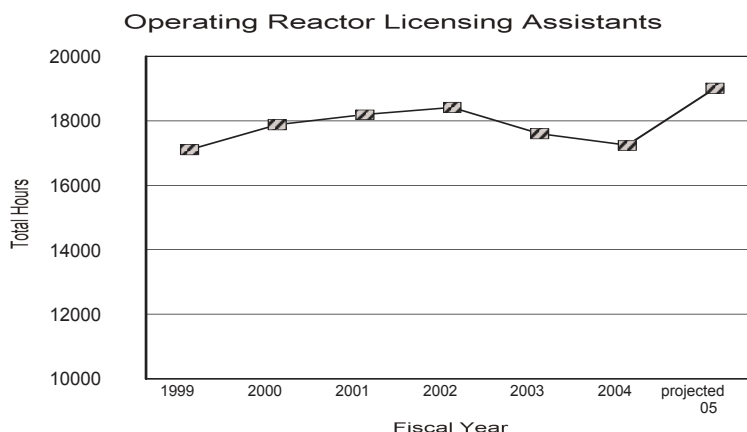
Many of the related activities are difficult to assess because there is little record of the breakdown of the work activities. For example, Figure 7-1 provides information on the hours charged to clerical/secretarial support for the licensing division in NRR (currently DLPM and previously DRPE and DRPW). The time period includes some significant organizational changes (structure and activities) and technological changes (e.g., ADAMS). Given the supporting activities were beyond the scope of the defined assessment, the team did not attempt to evaluate the data related to clerical or management support to the licensing program.

Figure 7-1



Similar data for the licensing assistants TAC number is shown in Figure 7-2.

Figure 7-2



As with the data on secretarial support, it is difficult to assess the effectiveness or productivity of the licensing assistants using the available data. The LAs basically charge to the TAC assigned to the position and no detailed information is available regarding a further breakdown of specific programs or tasks. To support future evaluations, the team recommends that LAs be assigned several TAC numbers to differentiate between various duties and program areas.

The project managers supporting the operating reactor licensing program have several interface TAC numbers to which they charge time. These activities support the licensing program as well as other NRC programs. Figures 7-3, 7-4, and 7-5 provide a breakdown of the hours charged to three interface activities (“interface with licensees,” “interface with regions,” and “headquarters interface,”) by operating unit (i.e., docket number) for fiscal year 2004.

Figure 7-3

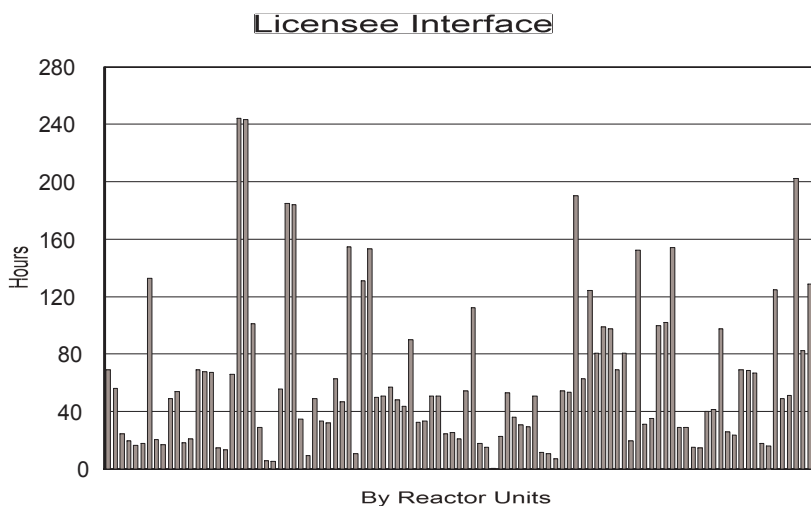


Figure 7-4

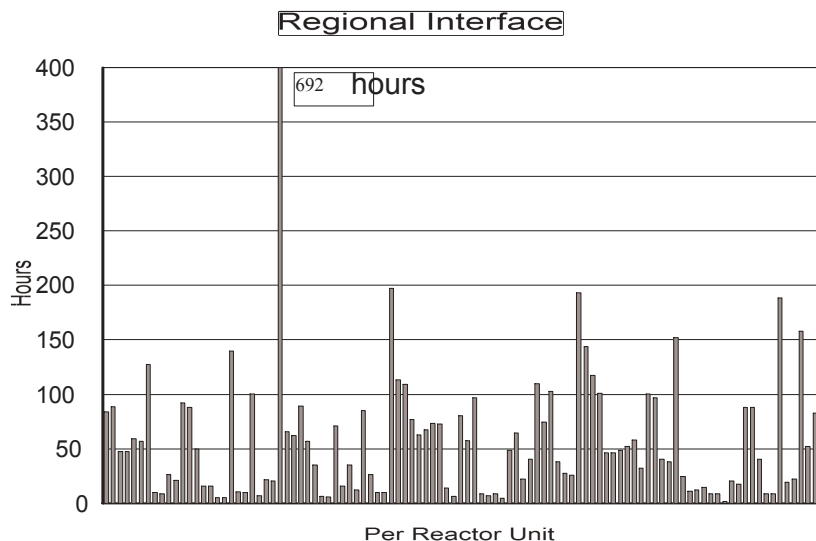


Figure 7-5

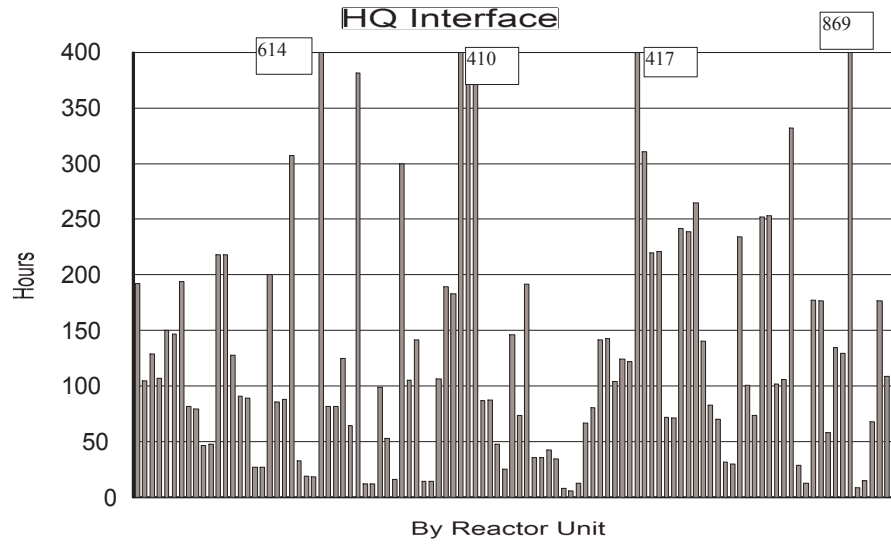
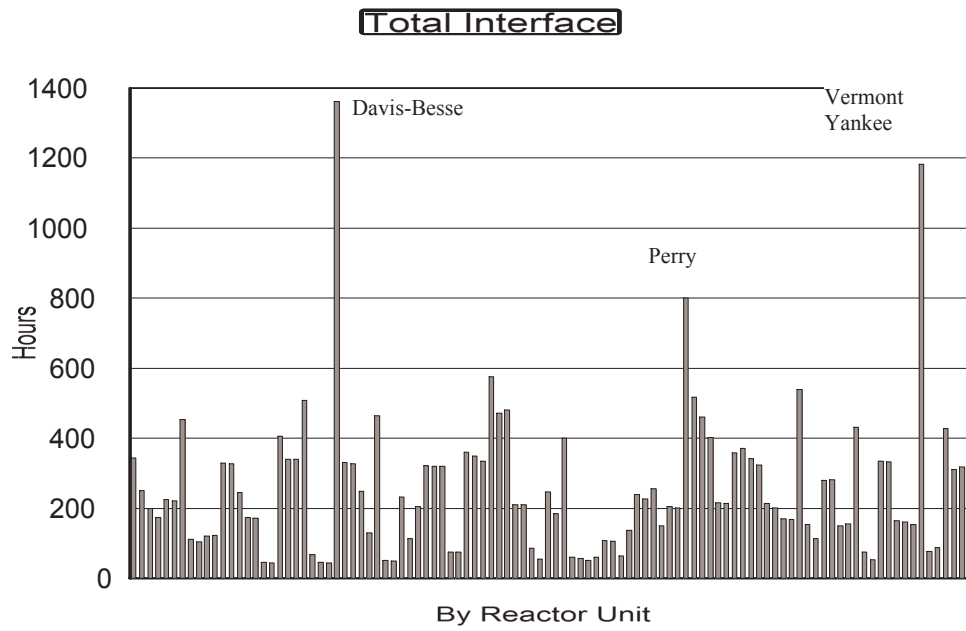


Figure 7-6



Several of the spikes in the hours charged to interface activities are predictable (e.g., Davis Besse and Vermont Yankee). Other observations of very few or very many hours charged to specific interface TACs are harder to explain. Looking especially at the licensee-interface charges (these are most closely related to licensing program), the evaluation team concludes that there is an excessive degree of variation. The team recommends:

- < NRR prepare and issue guidance and expectations on charging time to the interface TACs. Such guidance and expectations should include average numbers expected to be charged to each of the interface TACs.
- < In a related matter, overall guidance and expectations on charging time should be prepared, issued, and constantly reinforced. Many common questions remain on charging to administrative TACs, non-closing TACs, etc.
- < Whenever a significant amount of time is expected to be charged to activities related to a specific facility, issue-specific TACs should be created to track the workload related to that effort. Such TACs might be under the same PA Code as the interface TACs but would be separate from the non-closing interface TACs.