ROP Resource Analysis

A tabulation of staff resources expended for the Reactor Oversight Process (ROP) during the first four annual review periods is provided in Table 1. Specifically, the four review periods are (1) the first year of ROP implementation, (2) fiscal year (FY) 2001, (3) FY 2002, and (4) FY 2003[1].

As described in SECY-03-0062, "Reactor Oversight Process Self-Assessment for Calendar Year 2002," the staff reported a significant reduction in the staff hours expended for the ROP in 2002, with the bulk of the reduction in baseline inspection activities. A number of events during the 2002 inspection cycle challenged the ability of the NRC staff to complete the required baseline inspections. These challenges required regional staff to implement short-term coping strategies that resulted in reduced baseline inspection effort. The reduced baseline inspection effort in 2002 was primarily attributable to two factors:

- a shortage of qualified inspectors
- the diversion of inspection resources intended for baseline inspections to respond to unanticipated emerging events and external demands

The challenges that surfaced in 2002 continued into 2003; however, as a result of effective staff intervention, the impact was significantly reduced as further detailed below.

As reported in Table 1, baseline inspection effort in 2003 reflects an increase over 2002 and a return toward the nominal effort described in each baseline inspection procedure. Even though inspection effort increased in 2003 compared with 2002, there is a general, long term, decreasing trend in resource usage since initial implementation of the ROP.

Since 1995, inspection resource consumption has decreased on the order of 30 percent, and ROP implementation has continued this long-term downward trend. However, the staff believes that this trend will reach a limit as available efficiencies are exhausted as evidenced, for example, by the relatively unchanged effort in 2003 relative to 2002 for inspection preparation/documentation as a ratio of direct inspection effort. Future resource savings may only be possible through fundamental revisions of the ROP.

Plant-specific inspection effort increased significantly during 2003, compared with the previous evaluation periods (from approximately 16,000 hours to 24,600 hours). This increase is primarily attributable to the effort required for the restart inspections at the Davis-Besse Nuclear Station, as prescribed by Inspection Manual Chapter (IMC) 0350, "Oversight of Operating Reactor Facilities in a Shutdown Condition with Performance Problems," and the inspections related to performance issues at the Point Beach Nuclear Plant.

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[1] The ROP is implemented on a calendar year basis; however, the staff obtained and reported resource data on a fiscal year basis in order to meet the schedule requirements for this paper. There is no reason to believe that the results would be significantly different if the staff collected and reported resource data on a calendar year basis.

A significant increase was also seen in the 2003 inspection effort related to generic and plant-specific safety issues (GSIs and SIs). This increase is the result of the high level of inspection activity associated with temporary instructions issued in 2003 for issues related to safeguards, material accountability, containment sump blockage, and reactor vessel head and vessel head penetrations.

The effort expended in 2003 for performance assessment and the "other activities" listed in Table 1 has remained relatively constant. The current performance assessment activities are well established. The effort reported for the "other activities," such as inspection-related travel, is typically a function of the effort expended for direct inspection and usually tracks that direct effort.

Resource Model/ROP Inspection Budget

The resource model developed from data and experience gained during ROP initial implementation was used to develop budget requirements for the FY 2004 budget. However, experience gained during the 2002 and 2003 inspection cycles required additional refinements to the ROP resource model. Based on the refinements, a number of changes were made to the FY 2004 regional inspection budget as compared to the FY 2003 budget. For example:

- Resources for supplemental and reactive inspections have been increased 15 FTE to provide for regulatory oversight of a plant under IMC 0350, follow-up activities to verify licensees' improvement plans pursuant to Inspection Procedures 95002 and 95003, and reactor pressure vessel head inspections.
- Resources for performance assessment activities have been increased 4.8 FTE
- Program development resources have been decreased 2 FTE

These changes are included in the regional inspection budget for FY 2004 — FY 2006. Issues related to inspection resources will be reviewed as part of the ongoing ROP self-assessment. Resources will be adjusted as required by program needs.

ROP Efficiency Focus Group

In November 2001, the staff established the ROP Efficiency Focus Group, consisting of experienced staff from the regions and the Office of Nuclear Reactor Regulation (NRR), to explore ways in which to gain new efficiencies in the ROP. After evaluating a number of ideas, the focus group selected two suggestions for near-term implementation. Specifically, those suggestions were to (1) explore less resource-intensive alternatives to the annual performance assessment meeting for plants in the licensee response column of the Action Matrix, and (2) review the baseline inspection procedures to identify areas where consolidation is possible.

The staff is actively pursuing both of these suggestions. In particular, the staff has revised IMC 0305 to allow increased flexibility in scheduling the annual performance assessment meeting for plants in the licensee response and regulatory response columns of the Action Matrix throughout the entire assessment period. At the discretion of regional management, the staff may now schedule annual assessment meetings for these plants within six months after issuing the annual assessment letter.

The suggestion to consolidate the baseline inspection procedures has been undertaken initially for four groups of procedures and is currently being implemented in a pilot inspection program at selected sites in each region. The results will be provided at the conclusion of the pilot inspections. If the anticipated resource savings are realized, and assuming that effectiveness is maintained, the consolidation may be extended to other baseline procedures.

Challenges in the 2003 Inspection Cycle

The major component of the ROP is the baseline inspection program, which is performed at all reactor sites by NRC resident inspectors and inspectors from the regional offices. During the 2002 inspection cycle, regional offices indicated that they were seriously challenged in their ability to complete the baseline inspection program. As previously stated, the projected inability to complete the baseline inspection program at all reactor sites was primarily attributable to two factors:

- a shortage of qualified inspectors
- the diversion of inspection resources intended for baseline inspections in order to respond to unanticipated emerging events and external demands.

Regional staff implemented a number of strategies to avert the possibility of not completing the baseline inspection program in 2002. Although these short-term coping strategies allowed completion of the baseline inspections in 2002, the events of 2002 and the deferral and postponement of a number of activities impacted the conduct of the 2003 inspection program, as follows:

- *Inspections rescheduled from 2002 to 2003*
  A number of biennial and triennial inspections were deferred until 2003 to make inspection resources available in 2002. This resulted in more inspection resources needed in 2003 to perform the deferred inspections.

- *Delayed inspector training and qualification*
  Deferral of inspector qualification training in 2002 to permit use of “basic” qualified inspectors in completing 2002 baseline inspections delayed inspectors reaching full qualification. This delay impacted the number of fully qualified inspectors in 2003.

- *Deferred improvement/development efforts*

- *Impacts from Davis-Besse*
  The Davis-Besse event resulted in additional inspections. The lessons learned are being evaluated and could result in changes to the ROP. Also, continued restart inspections associated with the delayed restart of Davis-Besse added significantly to the 2003 inspection burden.

- *Inspection oversight at specific sites*
  Additional resources were used for increased oversight of plants with performance issues, reactor vessel head inspections and replacements, and restart activities for Browns Ferry 1.

- *Additional burden on resident and regional inspectors due to safeguards activities*

- *Additional burden on the regions to train and qualify a large number of new inspectors* In one region, for example, 33 new individuals were in the IMC 1245 reactor inspector qualification process during 2003.

In order to address these impacts and ensure that baseline inspections were completed as required during the 2003 inspection cycle, regional managers were asked, in May 2003, to identify possible inspection resource shortfalls for the 2003 inspection cycle. Responses to that request from Regions I and III indicated that baseline program needs would not be met without assistance. Region I was challenged primarily by the loss of qualified inspectors. Region III was challenged by Davis-Besse restart inspection needs, Point Beach supplemental inspections, and the delay of 11 baseline team inspections from 2002 to 2003. Region I estimated that it needed 43 staff-weeks of assistance; Region III estimated that it needed 120 staff-weeks.

Of the total of 163 staff-weeks of inspection support that Regions I and III requested, NRR, Region II, and Region IV provided 121 staff-weeks (90 staff-weeks to Region III and 31 staff-weeks to Region I). The balance was provided by additional contractor support and re-employment of three annuitants who were former regional inspectors. As a result, the 2003 baseline program requirements were met in all regions. However, the assistance provided resulted in some delays in personnel transfers and formal qualification processes in NRR, Region II and Region IV. The resource constraints also impacted the staff's ability to complete project work as scheduled; for example, delays in licensing activities, Significance Determination Process (SDP) improvement efforts, performance indicator (PI) activities, development of the Browns Ferry restart inspection manual chapter, and processing of ROP feedback forms.

Additionally, in 2003, the staff revised the resident inspector policy to allow early assignment of new resident and senior resident inspectors to a site. The new policy allows the regional administrator to assign a permanent resident inspector up to 12 months before the planned departure of the incumbent resident inspector. Similarly, the regional administrator can now assign senior resident inspectors up to six months before the planned departure of the incumbent. Regional management also implemented actions to reduce inspector vacancies through active recruiting; training new hires; and over-hiring in anticipation of retirements, attrition, and staff movement.

Long-Term Improvements

Although the actions described above provided the necessary relief during the 2003 inspection cycle, the staff is considering the following additional steps to prevent future difficulties:

- Continue efforts to identify areas for possible efficiency gains in the ROP, including evaluating the effectiveness of the ROP procedures and the effort to streamline the SDP Phase 2 process.
- Reconsider personnel staffing policies and continue aggressive hiring strategies by all four regions to avoid staffing shortfalls.

- Pursue and evaluate credit for licensee self-assessment. However, the staff will have to exercise care to ensure public confidence in the process as well as the NRC's ability to independently and adequately assess licensee performance.

These options will be evaluated as part of the ongoing ROP improvement process. In addition, during the 2004 inspection cycle, the staff intends to undertake a program review to understand the reasons for regional differences in expenditure rates, identify best practices in conducting inspections, and examine the concept of regional centers of expertise to determine whether specific inspections could be more effectively completed by dedicated inspectors.

In addition to the above, the staff will address one issue specific to Region I. Specifically, the current resource model treats Millstone Units 2 and 3 as two, single-unit sites instead of one, dual-unit site. This treatment allocates additional inspection resources to Millstone in order to address unique site features and historical circumstances that are currently being resolved. Region I has indicated that it will reevaluate the need for these additional resources concurrently with its review of Millstone resident inspector assignments. In consultation with Region I, the staff will reach a decision on the site status and inspection resource needs for Millstone during the 2004 inspection cycle.

A similar situation exists for Indian Point Units 2 and 3, which are currently treated as two, single-unit sites. The staff will also reevaluate the site status of the Indian Point units as consolidation of the two units under a single licensee continues; however, this will be a long-term reevaluation. The current status and inspection demands for Indian Point do not justify a near-term reduction of inspection resources for these units.

Table 1
Resources Expended
(Total Staff Effort Expended at Operating Power Reactors)

	52 weeks initial implementation 4/2/00-4/1/01	52 weeks FY 2001 9/24/00-9/22/01	52 weeks FY 2002 9/23/01-9/21/02	52 weeks FY 2003 9/29/02-9/27/03
Baseline/Core				
Direct Inspection Effort	128,447	130,330	119,884	123,027
Inspection Prep/Doc	115,935	109,227	91,385	91,230
Plant Status	43,751	46,191	44,228	46,755
Subtotal	288,133	285,748	255,497	261,012
Plant Specific Inspections				
Direct Inspection Effort	11,295	8,436	9,354	14,647
Inspection Prep/Doc	6,683	6,161	7,715	9,978
Subtotal	17,978	14,597	17,069	24,625
GSI/SI	2,416	918	1,718	3,953
Performance Assessment	21,017	19,845	17,293	20,013
Other Activities	47,190	49,471	43,627	48,058
Inspection Related Travel				
Routine Communication				
Regional Support				
Enforcement Support				
Significance Determination Process				
Review of Technical Documents				
Total Staff Effort (regular + nonreg hrs)	376,734 hrs	370,579 hrs	335,204 hrs	357,661 hrs
Total Staff Effort/Operating Site	5,623 hrs/site	5,531 hrs/site	5,003 hrs/site	5,338 hrs/site