

December 14, 2005

MEMORANDUM TO: Daniel Gillen, Deputy Director
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

FROM: Dominick A. Orlando, Technical Assistant */RA/*
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
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SUBJECT: EVALUATION OF EFFICIENCIES IN THE DECOMMISSIONING
PROGRAM

The U.S. Nuclear Regulatory Commission's Strategic Plan for fiscal year (FY) 2000-2005 identified a program evaluation entitled "Changes to the Decommissioning Process" to be conducted in FY 2003. In September 2003 the Decommissioning Program completed its evaluation. Recommendation 3(c) from this evaluation was to "Establish a baseline for decommissioning costs for specific sites and explore the feasibility of a method to measure efficiency and cost effectiveness". A summary of the Decommissioning Directorate's (DCD's) efforts, to date, to evaluate methods for determining efficiencies within the Decommissioning Program is attached. Note that, based on efforts to date, the staff will continue to evaluate this issue in FY 2006.

In summary, DCD has evaluated three approaches for determining efficiency in the Decommissioning Program: Decommissioning Plan (DP) and License Termination Plan (LTP) review time, Full Time Equivalent expenditure for DP reviews and quality of DPs and LTPs as measured by the number and sets of Requests for Additional Information. The available information indicates that, while the staff has become more effective in its reviews of DPs and LTPs, it is not clear if the staff has actually become more efficient. This is due to the varying complexity of sites, levels of expertise of licenses and other factors.

Therefore, in FY 2006 staff will continue to evaluate available information to identify additional approaches for evaluating efficiency within the Decommissioning Program.

It should be noted that Richard Chang provided significant outstanding support to this effort, in both the review and compilation of information and the preparation of the report.

If you have any questions concerning the report, please contact me at 301-415-6749.

Enclosure: Evaluating Efficiencies in the Decommissioning Program

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EVALUATING EFFICIENCIES IN THE DECOMMISSIONING PROGRAM

INTRODUCTION

Under the Government Results Act of 1993, Federal agencies are required to schedule conduct and report on program evaluations in selected areas. The U.S. Nuclear Regulatory Commission (NRC's) Strategic Plan for fiscal year (FY) 2000-2005 identified a program evaluation entitled "Changes to the Decommissioning Process" to be conducted in FY 2003. In September 2003 the Decommissioning Program completed its evaluation. Recommendation 3(c) from this evaluation was "Establish a baseline for decommissioning costs for specific sites and explore the feasibility of a method to measure efficiency and cost effectiveness". A summary of the Decommissioning Directorate (DCD) staff's efforts, to date, to evaluate methods for determining efficiencies within the Decommissioning Program is contained herein. Note that, based on efforts to date, the staff will continue to evaluate this issue in FY 2006.

It is important to recognize that the principal focus of the decommissioning program is to ensure that sites are decommissioned safely and returned to beneficial uses as quickly as possible. While the staff of the DCD must conduct its activities in a manner that is efficient, effective and open, it is not always possible to meet all of these requirements due to the varying degree of licensee expertise, ability, and willingness to conduct its activities in a similar manner. Furthermore, the complexity of site contamination and resulting dose assessment, the presence of subsurface soil and groundwater contamination, stakeholder concerns and the level to which stakeholders need to be included in the decommissioning process make a simple site-by-site- comparison uncertain. Such a comparison would not necessarily accurately reflect whether the staff efforts at one site are more "efficient" than at another site. In addition, while the staff may work closely with a licensee to ensure that its Decommissioning Plan (DP) is of suitable quality, it may not be in the licensee's fiscal interest to have the DP approved in a particular year. Finally, for a variety of additional reasons beyond the staff's control it might require more staff effort to gain the necessary level of quality in licensee submissions. Thus, regardless of NRC staff's efforts, a licensee could for, various reasons and ways, submit a substandard DP that would result in greater expenditure of time and resources.

APPROACHES

The first task was to set a "Baseline" year for decommissioning "costs." In this effort, cost refers only to the Full Time Equivalent (FTE) used in a project. DCD selected FY 2003 as the "baseline" year for this effort. This FY was selected because, at the end of FY 2003, DCD completed a multi-year effort to update, consolidate, and risk-inform all decommissioning guidance into a single NUREG document, NUREG-1757. This guidance incorporated "lessons learned" from earlier decommissioning projects and efforts by DCD to improve the Decommissioning Program. With the publication of the guidance for use by staff and licensees, DCD expected that the approaches and improvements in the NUREG guidance would result in a more efficient and effective means to manage the various decommissioning activities in the Decommissioning Program.

DCD compared various resource expenditures (i.e., FTE utilization rate) for each active site to determine if the resource expenditures improved from FY 2003 to FY 2005. We also evaluated the available information from FY 1997 to FY 2003 to establish historical resource expenditures.

However, before comparing resources, DCD evaluated the feasibility of using the time required to review and approve DPs as a measure of efficiency. Specifically, we evaluated "DP review

time" by grouping sites by the year the DP was submitted and determining the number of months it took to approve the DP. DP review was selected because the review and approval of a DP is a major licensing action and typically involves a significant expenditure of time and resources. Also, the review of the DP is the first of two critical actions by NRC in the decommissioning process. The second is the termination of the license. Finally, DP and LTP reviews are typically cited as the principal "choke point" in the early stages of the decommissioning process and, to date, DCD has expended significant efforts to improve the DP review process.

DCD also evaluated the number of requests for additional information and the number of sets of Requests for Additional Information (RAIs) that were necessary to complete the review and approval of DPs and LTPs. While not an indication of how efficient DCD is at reviewing the DP or LTP this evaluation provides insights into how effective DCD efforts have been to ensure that licensees provide high quality decommissioning documents. When licensees produce high quality DPs and LTPs, reviews may be shortened and the licensee can begin decommissioning earlier. DCD's stated goal with respect to RAIs is to only need to issue one set of RAIs for each DP or LTP.

RESULTS

DCD determined that for DPs submitted from calendar year (CY) 1997 through CY 2003, it took an average of 19.2 months from the DP submission date to approve the DP (See Table 1). However, for DPs submitted in CY 2004, it took an average of 13.8 months to approve a DP. This shows a general decrease (or improvement) in the time required to review and approve a DP. Decreased review time is not a direct measure of efficiency, as it does not consider the "cost" to do the review. However, it is an indication that the staff is becoming more "effective" as a quicker review allows the licensee to begin the site cleanup in a more timely manner. By extension, an earlier approval would result in completion of the project faster and return of sites to beneficial uses earlier than in previous years. This results in savings to the licensee and potentially frees up NRC staff resources for additional project work earlier.

In addition, DCD evaluated the same review and approval time for reactor License Termination Plans (LTPs). Between 1999 and 2005 the staff reviewed only six reactor LTPs. However, the staff review time for LTPs has significantly decreased from a high of 37 months for LTPs submitted in 2000 to 15 months for the latest reactor LTP approval. The same considerations regarding costs and effectiveness discussed above for complex materials sites applies to these reviews.

DCD then reviewed the resources (FTE) used to review complex site DPs submitted since 2000. FTE information for sites prior to 2000 was not reviewed as it was not believed to be comparable to current reporting methods (TAC codes). Based on this review, it appears that, while review times have decreased, the resources expended, as measured by the total hours reported by staff, has increased. This indicates that, while the staff is improving its effectiveness (for the reasons listed above) it may not be improving the "efficiency" of its reviews of DPs. (See Table 2)

However, the accuracy of this evaluation is affected by the individual complexity of the sites and the associated DPs, the individual skill sets, experience, review approaches and workloads of the reviewers, the complicating factors such as poor quality DP submissions and the need to re-review re-submitted DPs, the need to address varying levels of stakeholder concerns and the inaccuracies of the FTE accounting process itself. Therefore, it is not clear from the evaluation if simply using resource expenditures is an accurate measure of the staff's review efficiency.

For LTPs and DPs, both the number of RAIs and the number of sets of RAIs has declined from 2000 through 2004 (see Tables 3 & 4 and Figures 1 & 2) indicating that DCD's efforts have been successful. This does not necessarily show that the reviews of the DPs or LTPs is being done in a more efficient manner. However, it does clearly shows that our efforts are making the decommissioning process more effective.

In FY 2006, DCD established a goal of reducing LTP reviews by 30%, as a "stretch metric" to improve the "efficiency" of the Decommissioning Program. This improvement, as discussed above, may actually result in the staff becoming more "effective," as a quicker review allows the licensee to begin the site cleanup in a more timely manner, but potentially could require more staff resources to meet the goal. However, an earlier LTP approval could result in completion of the projects faster and return of sites to beneficial uses earlier than in previous years. This results in savings to the licensee and frees up NRC staff resources for additional project work earlier than in previous years. Thus, while a reduced review time for a DP or LTP by itself is not necessarily more efficient (because additional NRC resources may be needed to complete the review faster), the effective review of DPs and LTP results in a decommissioning project that, in the end, is less expensive for licensees and NRC.

FUTURE EFFORTS

In late CY 2005, DCD developed an approach for tracking resource expenditure based on aligning the TAC numbers for each decommissioning activity within the decommissioning program with the corresponding line item from Table C-3 in NRC budget request under which that activity occurred. We reviewed each TAC number and assigned it to a "bin" corresponding to a sub-Planned Activity listed in Table C-3. During FY 2006 staff will use the information developed using the above methodology to track resources to evaluate estimating efficiencies within the Decommissioning Program. The staff will compare the resources expended to complete DP reviews with the time for the approval to determine if the reviews are actually being conducted in a more efficient manner (i.e., "faster & cheaper").

DCD will also determine, to the extent possible if mitigating factors actually resulted in increased or decreased review time (e.g., proactive approach vs. a request for a hearing). In addition, DCD will consider other approaches for evaluating efficiency and will determine if they might be more appropriate to use in measuring the Decommissioning Program. Finally, we will evaluate the other high priority decommissioning activity, i.e., the review and approval of the Final Site Survey Report, to determine if the staff is completing these reviews in a more efficient manner.

CONCLUSION

In summary, DCD has evaluated three approaches for determining efficiency in the Decommissioning Program: Decommissioning Plan (DP) and License Termination Plan (LTP) review time, Full Time Equivalent expenditure for DP reviews and quality of DPs and LTPs as measured by the number and sets of Requests for Additional Information. The available information indicates that, while the staff has become more effective in its reviews of DPs and LTPs, it is not clear if the staff has actually become more efficient. This is due to the varying complexity of sites, levels of expertise of licenses and other factors. Therefore DCD determined that these approaches are not appropriate to evaluate efficiency in the Decommissioning Program. DCD will continue to evaluate the manner in which it administers the Decommissioning Program to identify additional approaches for determining efficiency within the program.

TABLE 1 - Time to Review and Approve DPs and LTPs

YEAR DP/LTP SUBMITTED	SITE	MONTHS TO APPROVE DP/LTP
Decommissioning Plans		
1997	AAR	8
	AIT	9
	Heritage Minerals	23
	Mallinkrodt	54
	Westinghouse, Waltz Mill	33
	X	25
1998	Kaiser, Phase 1	18
	Kerr-McGee, Cushing	12
	Permagrain	3
	United Nuclear	8
	UCAR	28
	X	14
1999	FMRI	52
	Ft McCellan	24
	JPG	38
	Molycorp, Washington	14
	LCAAP	15
	X	29
2000	Battelle	36
	Safetylight Corp	12
	X	24
2001	Kaiser, Phase 2	25
	Kerr-McGee Tech Cntr	26
	X	26
2002	Kirtland AFB	3
2003	ABB Prospects, Windsor	14

YEAR DP/LTP SUBMITTED	SITE	MONTHS TO APPROVE DP/LTP
	Englehard, Ravenna	9
	Eglin AFB	25
	Permagrain	6
	X	14
2004	MDNR	19
	NWI	5
	Pathfinder	17
	Ft Belvoir	14
	X	14
1997 -2002	X	22.1
2003-2004	X	14
License Termination Plans		
1999	Trojan	18
2000	Maine Yankee	37
	Saxton	37
	Connecticut Yankee	28
2003	Big Rock Point	23
2004	Yankee Rowe	15

TABLE 2 - Hours to Review and Approve DPs

YEAR	SITE	HOURS TO APPROVE DP
2000	Battelle	561
	Safetylight Corp	206
2001	Kaiser, Phase 2	1101
	Kerr-McGee Tech Cntr	399
2002	Kirtland AFB	161
2003	ABB Prospects, Windsor	567.5
	Englehard, Ravenna	info not available
	Eglin AFB	info not available
	Permagrain	132
	X	447
2004	MDNR	211
	NWI	149
	Pathfinder	1265
	Ft. Belvoir	663
	X	571

TABLE 3 -RAIs/site/ year submitted

Year	# RAIs	Site	Year	# RAIs	Site
2000	37	Battelle	2000	112	Maine Yankee
2000	13	Safety Light Corp	2000	55	Saxton
2001	39	Kaiser Phase 2	2000	112	Connecticut Yankee-Haddam
2001	26	Kerr-McGee Technical Center	2003	39	Big Rock Point
2002	5	Cabot Reading	2004	57	Yankee Rowe
2002	22	Kirtland AFB			
2003	24	ABB Windsor			
2003	0	Englehard Ravenna			
2003	14	Eglin AFB			
2004	4	MDNR			
2004	3	NWI			
2004	19	Pathfinder			
2004	11	Ft. Belvoir			

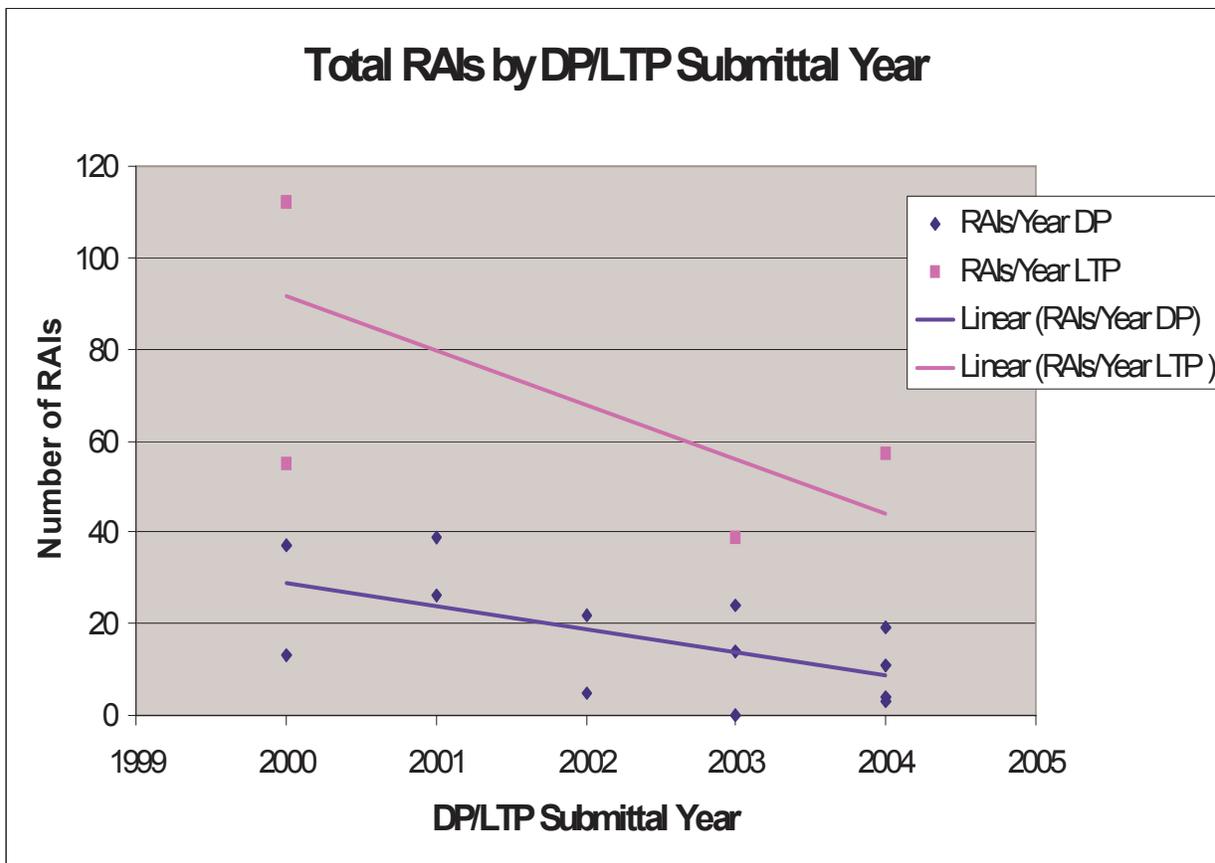


FIGURE 1 - Number of RAIs per year

TABLE 4 - Sets of RAIs/site/year submitted

Year	# Sets RAIs	Site	Year	# Sets RAIs	Site
2000	2	Safety Light Corp	2000	3	Maine Yankee
2000	3	Battelle	2000	6	Saxton
2001	2	Kaiser Phase 2	2000	2	Conn. Yankee-Haddam Neck
2001	3	Kerr-McGee Technical Center	2003	1	Big Rock Point
2002	2	Cabot Reading	2004	1	Yankee Rowe
2002	2	Kirtland AFB			
2003	4	ABB Windsor			
2003	0	Englehard Ravenna			
2003	2	Eglin AFB			
2004	1	MDNR			
2004	1	NWI			
2004	1	Pathfinder			
2004	1	Ft. Belvoir			

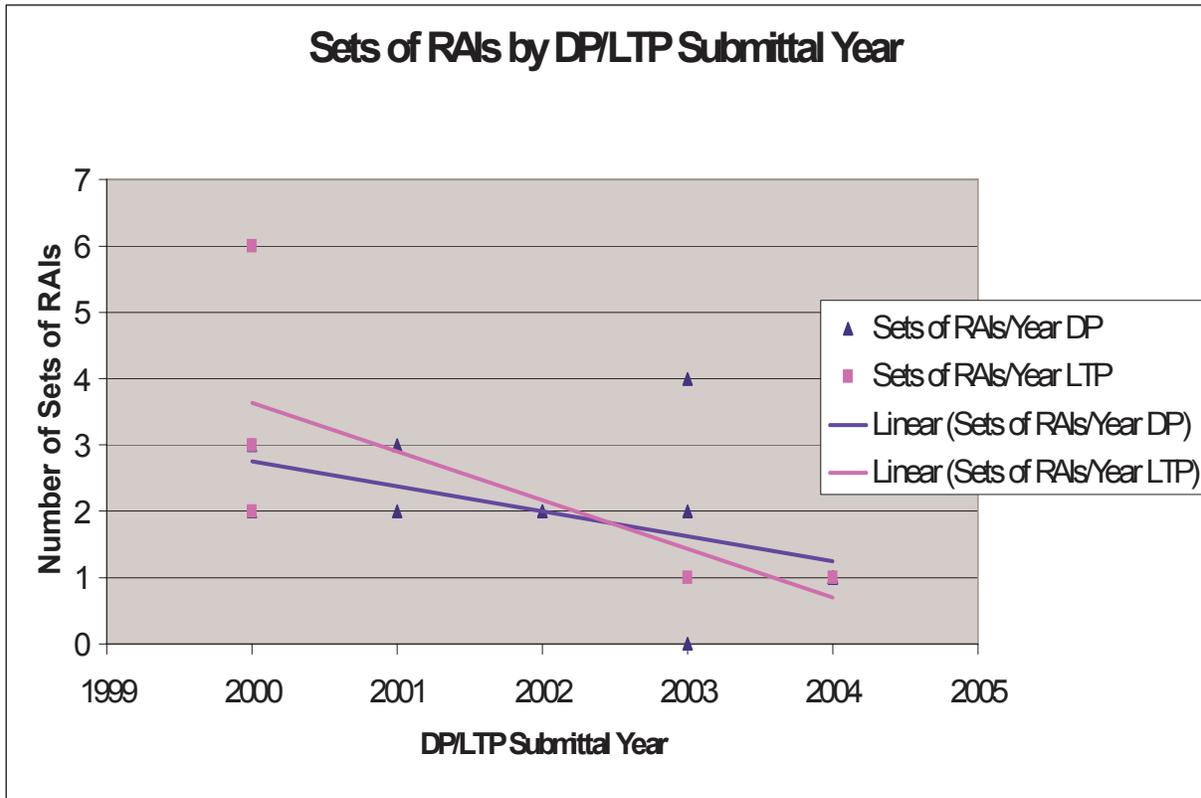


FIGURE 2 - Sets of RAIs per year