POLICY ISSUE
(Information)

June 3, 1996 SECY-96-120

FOR: The Commissioners

FROM: James M. Taylor
Executive Director for Operations

SUBJECT: NUCLEAR REGULATORY COMMISSION'S REFOCUSED PRELICENSING HIGH-LEVEL WASTE REPOSITORY PROGRAM

PURPOSE:

To inform the Commission of the major events impacting the Nuclear Regulatory Commission's High-Level Waste (HLW) Repository Program and how the staff has refocused its prelicensing program in response to these impacts.

SUMMARY:

In 1994 the Department of Energy (DOE) issued a program approach for streamlining its program and demonstrating clear measurable progress. Early in 1995, the NRC staff recognized the need to refocus its prelicensing HLW repository program on resolving the issues most significant to repository performance. Since that time both the NRC and DOE budgets were reduced and DOE's program revised. In addition, the National Academy of Sciences made recommendations regarding Yucca Mountain standards. These events have caused the staff to make additional changes to its program. This paper describes how the staff has revised its prelicensing objectives, refocused its approach, prioritized activities, reduced staff, and restructured organizations, along with responsibilities. Advantages and disadvantages to the staff's approach are discussed together with concerns about funding levels and the importance of maintaining a credible prelicensing program.

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A number of new activities under NRC's refocused prelicensing program are related to the regulatory framework. NRC will cooperate with the Environmental Protection Agency (EPA) to ensure development of reasonable and implementable HLW standards. These standards will be implemented by NRC through a simplified, risk-informed regulation specific to Yucca Mountain. Finally, the staff will support the Commission's review and concurrence on DOE's revised Siting Guidelines.

Many of NRC's prelicensing review activities, although not new, have been refocused and rescheduled. The staff has set program priorities based on resolving key technical issues (KTIs) that are most important to repository performance. For these issues the staff will provide timely feedback on potential licensing vulnerabilities for DOE's consideration in preparing its viability assessment for Yucca Mountain in 1998, which the staff expects to review. The staff will also review DOE's draft environmental impact statement (EIS) so that NRC can adopt the final EIS to the extent practicable. Activities directed at resolving the KTIs will provide the technical basis for comments on the sufficiency of at-depth site characterization and waste form to be included with DOE's site recommendation report to the President. To provide a sound technical basis for developing the implementing regulation, reviewing DOE's program, and resolving the KTIs, the staff will continue to develop and apply its independent technical assessment capability. Finally, the staff is improving program efficiency by streamlining the integration of NRC activities and simplifying procedures for NRC interactions with DOE and other parties.

BACKGROUND:

In 1994 DOE issued a program approach for streamlining its program and demonstrating clear measurable progress. Early in 1995, the NRC staff recognized the need to refocus its prelicensing HLW repository program on resolving the issues most significant to repository performance. Since that time, three major events have caused the staff to make additional changes to refocus its repository program. Although Congress is considering new legislation, enactment is uncertain. Therefore, the staff's refocused program is based on NRC's current statutory responsibilities in the HLW area. This paper describes how the staff has refocused its program and responds to the Commission's request for the staff to re-examine the funding for the HLW program and re-examine whether staff and the Center for Nuclear Waste Regulatory Analyses (CNWRA) have the expertise needed to review DOE's revised program approach (Staff Requirements Memorandum dated December 16, 1994).

The first major event impacting NRC's program was the reduction of Congressional appropriations for NRC's HLW program, in FY 1996, from $22 million to $11 million. Use of previous-year funds to supplement the FY 1996 appropriation resulted in a $17 million funding level for the overall HLW program. Attachment 1 gives a breakdown of the budget reduction for the repository and interim storage, including the FY 1996 appropriation, FY 1997 request, and use of previous-year funds for both years.

Second, DOE's FY 1996 budget for the repository program at Yucca Mountain was reduced from the $375 million provided by Congress in FY 1995 to the $250 million appropriated in FY 1996. Such reductions, together with Congressional guidance, led DOE to begin revising its Program Approach in early FY 1996 to address the critical unanswered technical questions leading to an assessment, in late FY 1998, of the viability of licensing the proposed repository site at Yucca Mountain. The viability assessment is intended to provide a better understanding of the repository design and its performance in the geologic setting, a better appreciation of the remaining work needed to prepare a license application, and a more accurate estimate of the cost of a repository. DOE expects that this information will provide sufficient financial and technical data to allow Congress to decide whether to continue the program to repository licensing and construction. Thus, DOE considers the viability assessment to be an early and integral step in the path to preparing a repository EIS and a license application. Furthermore, in an April 1996 statement of policy on S. 1271, the Nuclear Waste Policy Act of 1996, the Administration emphasized that no decision will be made about an interim storage site before the viability of a permanent geologic repository has been determined.

Taken together, the Congressional guidance and the severe budget constraints resulted in DOE reducing its site characterization activities to those core scientific activities necessary to determine suitability of the site and complete conceptual designs for the repository and waste package. These remaining activities will be further focused by DOE's waste containment and isolation strategy that is near completion. Hypotheses making up this strategy represent an integrated safety case for Yucca Mountain that DOE intends to test, using existing data, together with additional data from limited future testing. During March and April of 1996 DOE released new information about its evolving program, including a revised schedule (Attachment 2). Although preparing the viability assessment remains the major near-term mission, DOE announced schedules for several additional activities that had been eliminated from earlier plans or not previously scheduled. Of particular importance to NRC's program are: a revision to the Siting Guidelines (10 CFR Part 960) in FY 1997, which requires Commission concurrence; a final EIS in FY 1999; a site recommendation report in FY 2001 (including NRC's sufficiency comments); and a license application in FY 2002. DOE also described a phased approach to preparing the repository design and the project integrated safety assessment, which will integrate data, assumptions, designs, and assessments into one common document, to support the viability assessment, site recommendation report, EIS, and the license application. DOE plans on preparing important sections of this document in FY 1997-1998, including data synthesis and site process models that, together with the designs, will be the major inputs to DOE's total system performance assessment. As DOE continues to implement its revised program approach, more detailed information will become available. This summer DOE expects to release detailed information in a program plan and in its waste containment and isolation strategy.

A third event impacting NRC's program was the issuance of the August 1995 National Academy of Sciences report, which contained findings and

recommendations for Yucca Mountain standards. This action was the first in a series of actions under the Energy Policy Act of 1992 (EnPA), which also requires EPA to develop Yucca Mountain specific standards and for NRC regulations to be consistent with these standards. Under EnPA, EPA and NRC must establish standards and regulations, respectively, consistent with these recommendations. Although the report provides thoughtful and studied recommendations, a number of areas will require additional efforts, from EPA and NRC, to formulate reasonable and implementable regulations. These areas include the definition of an appropriate level of risk, compliance period, exposure scenarios, reference biosphere, and composition of a critical group. EPA is expected to issue a proposed standard for public comment in June 1996 and a final standard in FY 1997.

DISCUSSION:

I. NRC's Refocused Prelicensing Program

A. Revised Prelicensing Objectives

The staff's recognition of the need to refocus its prelicensing program, as well as the impacts described above, have resulted in a revised prelicensing schedule (Attachment 3) and the revised prelicensing objectives given below. Although new legislation is being considered, enactment is uncertain. Therefore, the staff's refocused program is based on NRC's current statutory responsibilities in the HLW area.

1) Cooperate with EPA to ensure development of reasonable and implementable HLW standards. Implement these standards through a simplified, risk-informed regulation specific to Yucca Mountain;

2) Review and advise the Commission on concurrence of DOE's Siting Guidelines in Part 960;

3) Set program priorities based on KTIs that are most important to repository performance. Achieve agreement with DOE on KTIs. Make progress toward KTI resolution at the staff level;

4) Provide timely feedback to DOE on potentially significant site, design, or assessment vulnerabilities for DOE's consideration in preparing its 1998 viability assessment. Review DOE's viability assessment to identify licensing vulnerabilities;

5) Develop and exercise independent technical assessment capability necessary to: implement EPA standards, evaluate significance of KTIs and develop paths to resolution, test the hypotheses and assumptions of DOE's waste containment and isolation strategy, provide feedback to DOE for consideration in preparing its viability assessment, provide sufficiency comments for incorporation into DOE's site recommendation report, and eventually review a license application;

6) Improve program efficiency by streamlining integration of NRC activities and simplifying procedures for NRC interactions with DOE and other parties;

7) Review and provide comments on DOE's draft EIS so that NRC can adopt the final EIS to the extent practicable as provided in the Nuclear Waste Policy Act of 1982 (NWPA); and

(8) Provide comments on sufficiency of at-depth site characterization and waste form for DOE to include in its site recommendation report.

Two of the above objectives are related to statutory responsibilities independent of DOE schedules and products. These include establishing implementable regulations consistent with EnPA direction and evaluating the sufficiency of at-depth site characterization and waste form.

B. Refocused Approach

To achieve the revised objectives in a resource-constrained environment, NRC has also revised its approach to focus on resolving ten KTIs that the staff considers to be the most important to repository performance and therefore licensing (see Attachment 4). These issues were identified through NRC's iterative performance assessments, a systematic analysis of 10 CFR Part 60, review of DOE's draft waste containment and isolation strategy, and staff understanding of the relevant processes and events at the Yucca Mountain site, based on independent studies, evaluations, reviews of DOE's work, and other experience. The NRC staff will periodically reevaluate the significance of the KTIs considering new information and performance assessments. In a November 1995 technical exchange on KTIs, DOE and NRC agreed on the potential significance to repository performance of eight of the ten issues. DOE questioned the technical basis for two of these KTIs, dealing, respectively, with the significance of igneous activity and structural deformation and seismicity. NRC staff is evaluating data, conducting analyses, and interacting with DOE and other parties to clarify differences on these issues.

Because each of the ten KTIs encompasses a number of important subissues, the NRC staff is using a "vertical slice" or audit approach that has been successfully used in other areas of NRC responsibility, including reactor licensing. To further focus the work within each KTI, the staff will evaluate a few narrow slices (focused, well-defined scope) in depth; conclusions about resolution of the broader issue will be inferred from examining these slices in detail. Within a particular vertical slice, the staff plans to conduct appropriate activities such as: evaluate alternate conceptual models, including underlying data and assumptions; conduct independent modeling for use in sensitivity and importance analyses; conduct limited technical investigations, including laboratory tests, to develop an independent understanding of relevant processes; review DOE data and independent literature; establish acceptance criteria, to guide reviews and issue resolution; and establish clear objectives for each interaction with DOE and other parties, to help ensure progress toward issue resolution.

NRC's approach is to focus all the staff's activities on resolution of the 10 KTIs at the staff level. Issue resolution is achieved when the NRC staff has no further questions or comments regarding how DOE is addressing the issues in its program. However, the staff recognizes that there may be some cases where reaching a common understanding about our differences may be the best that can be achieved. The staff will prepare periodic issue resolution status reports to document significant progress and give DOE timely feedback. In addition, an annual issue resolution progress report will summarize the significant technical work completed for each of the ten KTIs during the fiscal year. To the extent that NRC and DOE can resolve issues before the viability assessment, there would be greater confidence that the potential licensing vulnerabilities have been properly addressed by DOE in its viability assessment.

C. Prioritized Activities

To focus its limited resources most effectively on issue resolution, the staff prioritized all the activities (i.e., technical assistance and research) believed necessary to resolve each of the ten KTIs before licensing. Priorities were established by considering: the significance of the work to repository performance and issue resolution; appropriate timing of feedback to DOE; and the lead times necessary to conduct activities. Resources were estimated for the prioritized activities, which led to identifying both funded and unfunded activities for FY 1996. The staff intends to revisit the defined activities and prioritization each year, during the budget cycle, considering new information and the results of performance assessments. The objective is to complete all high-priority work for issue resolution before licensing, assuming a funding level of about $17 million. Attachment 5 gives an overview of funded and unfunded KTI activities for FY 1996.

Activities funded for resolving the KTI entitled "Total System Performance Assessment (TSPA) and Technical Integration" are particularly important to NRC's approach. The integrated assessments conducted as part of this KTI will provide the basis for continuing confirmation or revision of the significance of NRC's KTIs to repository performance and identifying new issues that might need to be considered. It will also provide for a systems perspective in the evaluation of DOE's waste containment and isolation strategy, including DOE's performance assessment, which will be a centerpiece of DOE's viability assessment and ultimately the license application. Sensitivity and importance analyses will also facilitate an understanding of the relative significance of processes and events to repository performance and provide a basis for concluding that certain effects have been appropriately bounded. This information will be vitally important to issue resolution and compliance determination. These analyses will also indicate where additional detailed analyses or data may be necessary to narrow uncertainties. Finally, the integration activities under this KTI will be essential for ensuring that interfaces among NRC activities are identified and that there is consistent and appropriate information flow among these activities.

Resolving the KTI entitled "Support Development of the EPA Standard and NRC Regulation" will differ from the way the other nine KTIs are resolved. Issue resolution will be achieved by working cooperatively with EPA in developing and implementing the EPA standard. In parallel with this inter-agency cooperative effort, a conceptual outline will be developed, of a simplified, risk-informed regulation specific for Yucca Mountain, to seek early Commission guidance on the development of implementing regulations and to facilitate openness in fulfilling our EnPA responsibilities.

Some of the recent major changes to DOE's revised program approach described in the background section and shown in Attachment 2 will necessitate future adjustments to the staff's KTI priorities, schedules, and resource allocations summarized above. The staff will continue to evaluate DOE's revised program as more details become available. The only adjustment needed in FY 1996-1997 is to the KTI entitled "Support the Development of the EPA Standard and NRC Regulation." An activity will be added to this KTI and resources reallocated for staff review of DOE's revised siting guidelines in Part 960, to support Commission concurrence. The remaining adjustments are for FY 1998-2002, and most have been previously planned, but schedules have changed in response to DOE's revised schedules. These include: staff review of DOE's viability assessment; staff review of DOE's EIS; completion of the License Application Review Plan consistent with regulations specific for a Yucca Mountain site; preparation of comments on the sufficiency of at-depth site characterization and waste form to be included in DOE's site recommendation report; and license application review. Attachment 3 shows a tentative schedule for these activities based on a preliminary review of the general information that DOE has released to date about its revised program.

D. Reduced Staff, Restructured Organizations, and Responsibilities

Refocusing the HLW repository program within the reduced $17 million funding level resulted in a total reduction of 16 NRC full-time equivalents (FTEs) -- eight from the Office of Nuclear Material Safety and Safeguards (NMSS), six from the Office of Nuclear Regulatory Research (RES), one from the Office of Information Resources Management, and one from the Advisory Committee on Nuclear Waste. These reductions have been accomplished through reassigning staff to other programs. At the CNWRA, the current funding level will support only 46 FTEs, a reduction of 8 FTEs from the core staff requirement of 54 FTEs. An effort is being made to maintain the CNWRA at the core staff level of 54 FTEs by allowing the CNWRA to do other than HLW work. Reductions at the CNWRA were accommodated by attrition as well as elimination of some temporary positions and subcontractors.

Staff reductions and improving efficiency and integration of staff activities have led to a number of changes that have restructured organizations and responsibilities. In February 1996 the Division of Waste Management (DWM) reorganized, to consolidate its HLW activities in two branches instead of the previous three. This action was taken to improve coordination and to better direct management attention. Additional changes were made within DWM branches and at the CNWRA to redistribute supervisory responsibilities and to facilitate multi-disciplinary interaction. In addition, the HLW Management

Review Board (Board) was established to support the DWM Director by providing management oversight of the refocused program. The Board is made up of management representatives from each of the NRC organizations with a major role in the HLW Repository Program, as well as a management representative from the CNWRA. The intent of establishing this Board was to improve the overall integration of the program by recommending policies and implementation guidance for the DWM Director to consider that had been coordinated to take into account the views of the various organizations involved. As an example, based on the Board's recommendations, the DWM Director, in consultation with the NMSS and RES Directors, made the final decisions regarding staff reductions and program priorities.

The NRC and CNWRA staff were also restructured into ten KTI teams made up of a combination of NRC and CNWRA staff having the necessary technical and regulatory expertise for resolving each KTI. With oversight from the Board, each KTI team is responsible for planning and conducting those activities needed to resolve its issue within the established schedule and budget. The 10 multidisciplinary teams represent the core technical expertise needed for the refocused program under the $17 million funding level. Sustaining this expertise was a key consideration in management decisions about staff reductions. Reductions in NMSS, RES, and CNWRA staff expertise have occurred in a broad range of skills including geology, hydrology, engineering, project management, quality assurance, and systems engineering. These reductions were chosen to minimize the impact on the core technical expertise required to resolve the KTIs. Many of the staff members in the core technical disciplines have specialized experience related to the KTIs that would be difficult and time-consuming to replace.

Finally, with the reassignment of the six RES FTEs to programs other than HLW, responsibility for contract management of the essential research activities funded under the KTIs at the CNWRA was consolidated within NMSS, along with the existing responsibility for contract management of the CNWRA's technical assistance activities. RES has been authorized 0.5 FTE for its HLW activities to assure that RES, NMSS, and the CNWRA remain in a highly interactive mode using a variety of agreed to interactions. As a result, NMSS and CNWRA HLW activities should benefit from RES's generic research program, focusing on radionuclide behavior and transport in the environment, that could yield results for the HLW program (as well as to low-level waste and decommissioning programs). Furthermore, RES will be able to remain cognizant of NMSS and CNWRA HLW activities and technical issues.

II. Advantages and Disadvantages of Refocused Approach

Numerous advantages are apparent in refocusing NRC's program on KTIs using the vertical slice approach. Scarce resources are focused on those issues most significant to repository performance, thus enhancing attention to safety. Issue resolution is facilitated by acknowledging the appropriate bounding of less significant effects and focusing interactions with DOE on those factual or interpretative differences with the greatest significance to performance. The audit nature of the vertical slice approach effectively evaluates a wide

range of DOE activities and identifies how well they are integrated. Integration of the NRC program is improved by coordinating the necessary activities and technical disciplines in the review of each issue. Focusing on issues that are potential licensing vulnerabilities is a robust approach that is not highly dependent on DOE products and thus is less likely to be seriously impacted by some potential future changes in DOE's program. Finally, the approach is flexible enough to make necessary changes to the issues or priority of activities based on new site information or new insights regarding repository performance.

As with any approach there are some disadvantages. The audit nature of focusing only on the ten KTIs and selected vertical slices within each issue will result in areas of DOE's program that will not be examined in detail during prelicensing. Also, if some vulnerabilities are not recognized as KTIs during prelicensing, the licensing review could be extended. Finally, the $17 million program is not sufficient to maintain the breadth and depth of CNWRA technical expertise at the core level of 54 FTEs needed for the HLW program. A February 28, 1996, Commission paper (SECY-96-044) describes how the staff plans to mitigate the impact of the reduced HLW budget on the CNWRA by enhancing the CNWRA's ability to perform work, under the "work for others" provision, sufficient to maintain the disciplines considered essential to support NRC's HLW program.

III. Minimally Acceptable Funding Level

Under the reduced funding level of $17 million, the staff's approach of focusing on only the ten KTIs and selected high-priority activities within each KTI represents the minimally acceptable prelicensing repository program. With the exception of the KTI on supporting development of the EPA standard and NRC regulation, all the KTIs represent potentially significant vulnerabilities to the viability of the Yucca Mountain site and potential future licensing. Therefore, resolving each issue is important to eventual repository licensing. To achieve this, evaluations based on the independent technical investigations and analyses conducted by the multidisciplinary KTI teams are essential. As mentioned above there are disadvantages even to this minimally acceptable program. Further reductions would seriously limit the NRC staff's ability to evaluate key licensing vulnerabilities during the prelicensing phase.

As shown in Enclosure 1, the $17 million funding level can be maintained in FY 1996-FY 1997 through a combination of the increased FY 1997 budget request and use of previous-year funds. However, in FY 1998, previous-year funds will no longer be available.

IV. Importance of Maintaining a Credible Prelicensing Program

A sustained and credible prelicensing program is important to the success of the national program for several reasons. First, NRC must ensure that practical and implementable safety standards and regulations are developed. Second, NRC must be prepared to comment on DOE's viability assessment for Yucca Mountain. Although the staff recognizes that DOE's viability assessment

is not a regulatory document, it certainly will be the basis for decisions about the future of the national program for storage and disposal of HLW and spent fuel. NRC's comments on the potential vulnerabilities of the Yucca Mountain site from a licensability viewpoint and the licensing assumptions underlying DOE's cost estimates are essential inputs to what will undoubtedly be a complex and controversial decision-making process. Finally, a credible prelicensing program is essential for identifying potential licensing issues

early in the repository development process, rather than later after substantial investments have been made. As DOE prepares its waste containment and isolation strategy and supporting program plan, critical decisions are being made to focus the program on what is important to repository performance. Although commendable, such decisions will be the basis for identifying those site characterization and design activities that can be either eliminated, reduced, or delayed, in order to stay within the budget. As NRC, DOE, and other parties work toward resolution of the KTIs, it will be essential for NRC to advise DOE if these reductions will pose a risk to licensing. If so, they might be the basis for comments on the sufficiency of DOE's at-depth site characterization and waste form proposal.

CONCLUSIONS:

On balance, the NRC staff believes that the refocused program is an efficient and effective way to streamline NRC's prelicensing program and enhance the focus on safety of the repository program in an environment of constrained resources. This program provides the essential technical basis for fulfilling NRC's responsibilities independent of DOE including establishing implementable regulations consistent with EnPA direction and evaluating the sufficiency of at-depth site characterization and waste form during the prelicensing period under NWPA. Focusing on KTIs that are potential licensing vulnerabilities is a robust approach that is not highly dependent on DOE's products and thus is less likely to be impacted by potential future changes to DOE's program. Finally, the approach is flexible enough to make necessary changes to issues or priority of activities based on new site information or insights about repository performance. Sustaining a funding level of $17 million primarily dedicated to repository issues is essential to maintaining a credible prelicensing program. Further reductions would seriously limit the NRC staff's ability to evaluate key licensing vulnerabilities during the prelicensing phase.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection.

James M. Taylor
Executive Director
for Operations

Attachments:
1. NRC HLW Program Budget Reduction FY95-97
2. DOE Revised Program Schedule
3. NRC's Refocused Program Schedule
4. NRC's Key Technical Issues List
5. Overview of NRC Program Activities in FY96

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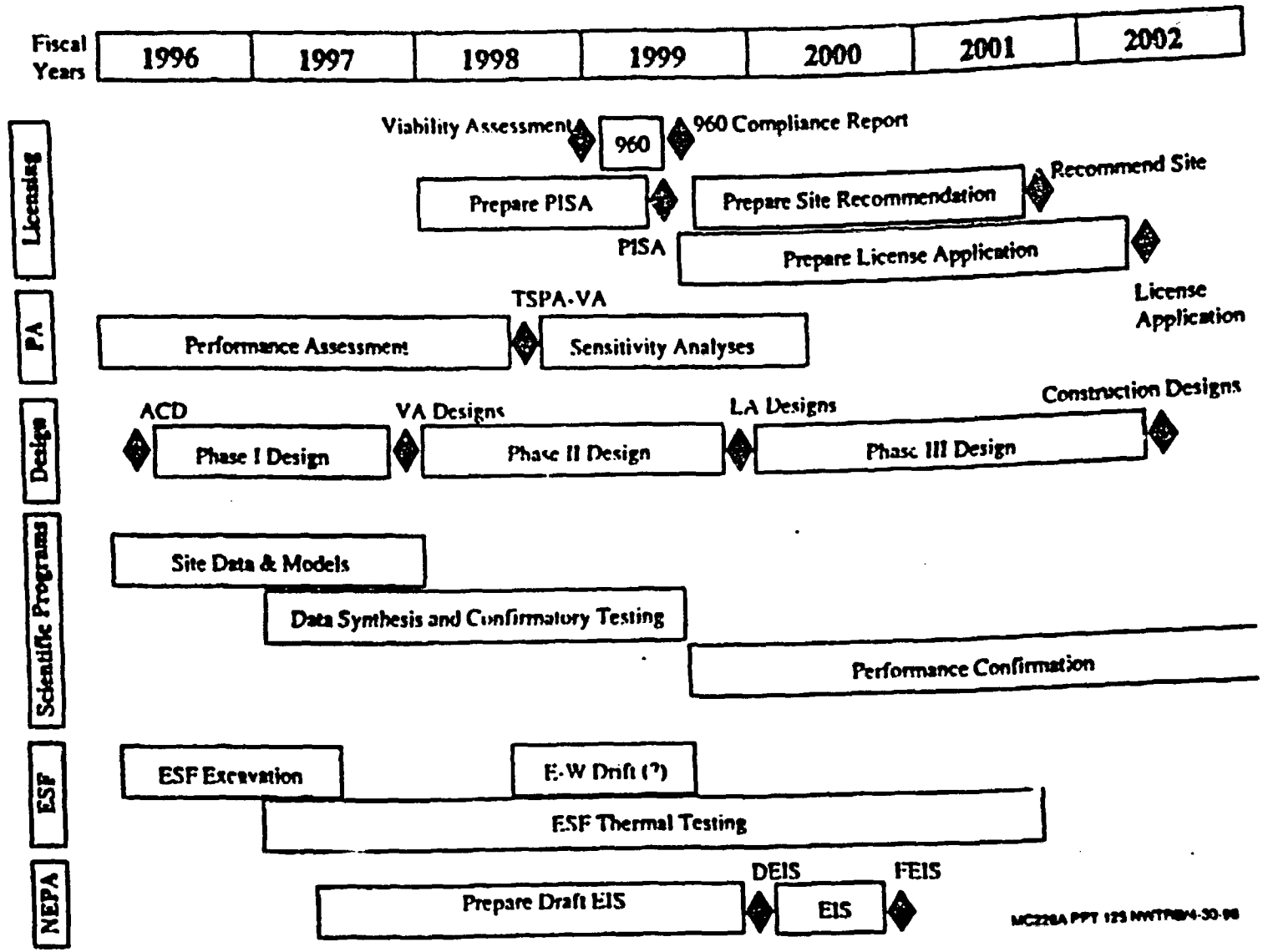
NRC HLW PROGRAM BUDGET REDUCTION

	FY95		FY96		FY97	
	FTE	$M	FTE	$M	FTE	$M
REPOSITORY PROGRAM						
Staff, Benefits, and Travel	57	5.6	41	3.8	41	3.8
Program Support	--	16.2	--	12.9	--	12.9
(CNWRA FTE—part of $M)		(54)		(46)		(46)
INTERIM STORAGE PROGRAM (Based on limited generic work)						
Staff, Benefits, and Travel	2	0.2	2	0.2	2	0.2
Program Support			--	0.1	--	0.1
Total	59	22.0	43	17.0	43	17.0

- FY96 Appropriation = $11M, Previous Year Funds = $6M
- FY97 Request = $14M, Previous Year Funds = $3M
- $14M in FY98 would continue to support 41 NRC FTE for the repository program but would further reduce CNWRA FTE to 36
- No Nuclear Waste Fund previous year funds available in FY98

Attachment 1

DOE REVISED PROGRAM SCHEDULE
(April 30, 1996)

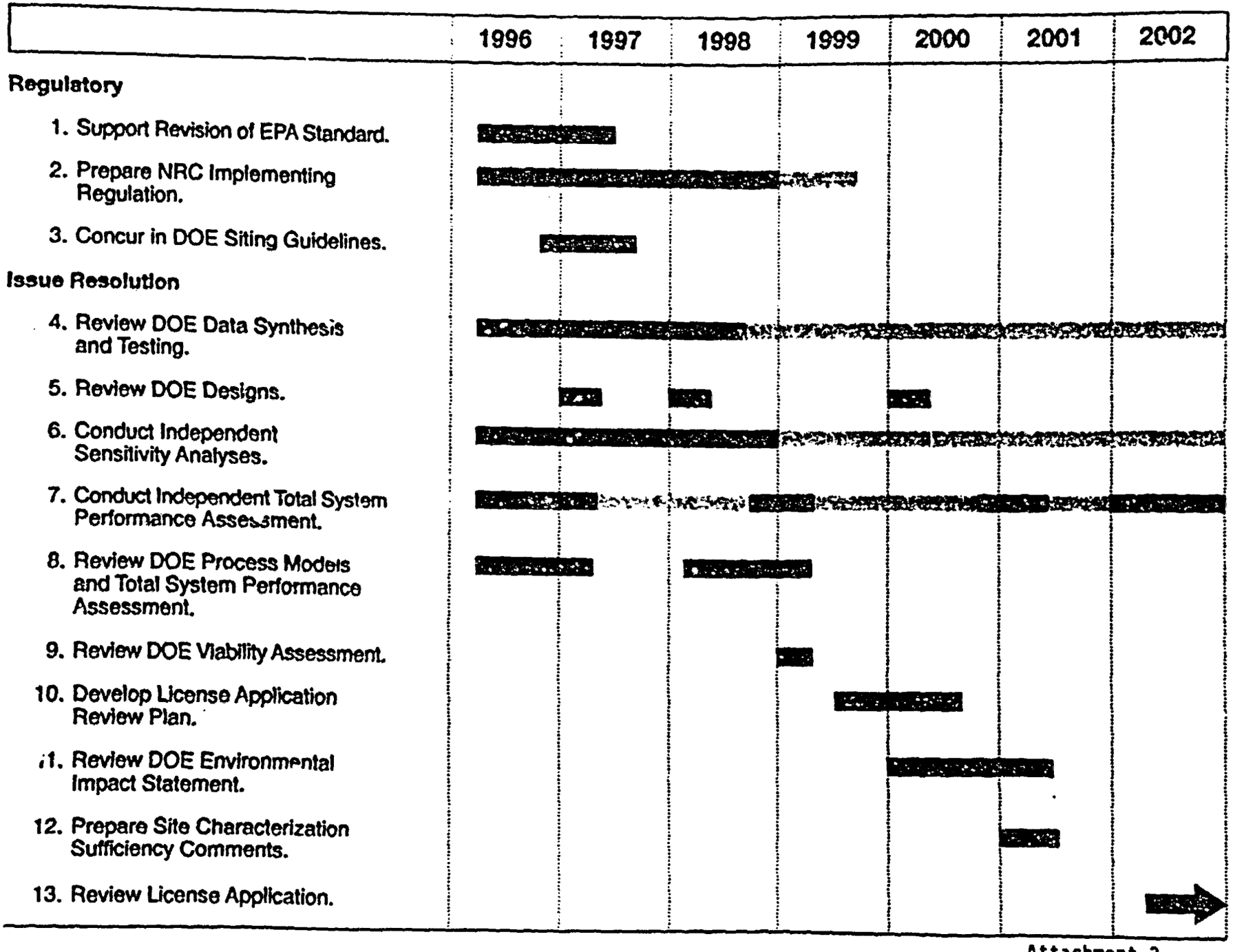


Note:

PISA – Project Integrated Safety Assessment
VA – Viability Assessment
TSPA – Total System Performance Assessment
LA – License Application
ACD – Advanced Conceptual Design
ESF – Exploratory Studies Facility
DEIS – Draft Environmental Impact Statement
FEIS – Final Environmental Impact Statement
NEPA – National Environmen al Policy Act

Attachment 2

NRC'S REFOCUSED PROGRAM SCHEDULE
Fiscal Year



Attachment 3

LIST OF NRC'S KEY TECHNICAL ISSUES

1. Igneous activity (volcanism)
2. Structural deformation and seismicity
3. Unsaturated and saturated flow under isothermal conditions
4. Thermal effects on flow
5. Evolution of the near-field environment
6. Container life and source term
7. Radionuclide transport
8. Repository design and thermal-mechanical effects
9. Total system performance assessment and technical integration
10. Support development of the EPA standard and NRC regulation

OVERVIEW OF NRC PROGRAM ACTIVITIES IN FY 1996

Key Funded NRC Program Activities

- Work cooperatively with U.S. Environmental Protection Agency to develop a Yucca Mountain-specific HLW standard consistent with National Academy of Sciences' recommendations and begin preparing U.S. Nuclear Regulatory Commission's implementing regulation.

- Review U.S. Department of Energy (DOE) data related to key technical issues (KTIs) and conduct modeling and sensitivity analyses to independently evaluate whether the issues pose a risk to repository licensing.

- Continue interactions with DOE and other parties through use of video conferencing and enhanced role of on-site representatives.

- Use Total System Performance Assessment to provide the framework for both verifying and resolving NRC KTIs and for evaluating DOE's Waste Isolation Strategy.

- Develop acceptance criteria and review procedures necessary to evaluate KTI resolution.

- Conduct research for only those KTIs most significant to repository performance and having a high likelihood of success before licensing.

Reduced NRC Program Activities

- NRC quality assurance observation audits and in-field verifications significantly reduced

- Oversight of DOE field work reduced

- Review of DOE study plans and test procedures for collection of data eliminated

- Review of DOE Site Characterization Plan progress reports not planned

- Reviews of DOE designs limited

- Peer reviews of Center for Nuclear Waste Regulatory Analyses (CNWRA) work conducted through peer-review journal publications and limited review by external experts

- Use of CNWRA consultants reduced

- License Application Review Plan deferred until the FY 1999-2000 time frame

- Research efforts reduced (including field investigations, laboratory testing, and model development for key technical issues on igneous activity, unsaturated flow, container life, and radionuclide transport)