SEP 24 1993

MEMORANDUM FOR: Jesse L. Funches, Chairman
Management Control Committee

FROM: B. J. Youngblood, Director
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards

SUBJECT: RESULTS OF 1993 MANAGEMENT CONTROL REVIEW

As Program Manager of High-Level Waste Repository (Prelicensing), I am cognizant of the importance of management controls. I supervised the management control review performed this year on the Assessable Unit designated High-Level Waste Repository (Prelicensing), as called for by the NRC five-year Management Control Plan. I certify that the review was conducted in a conscientious and thorough manner in accordance with Guidelines for the Evaluation and Improvement of and Reporting on Internal Control Systems in the Federal Government, issued by the Director of the Office of Management and Budget, in consultation with the Comptroller General, as required by the Federal Managers' Financial Integrity Act of 1982. The review included an evaluation of whether management controls were in compliance with standards prescribed by the Comptroller General.

In accordance with OMB Circular A-123, the objective of the review was to determine whether the management controls are adequate to provide management with reasonable assurance that

- obligations and costs comply with applicable law;
- assets are safeguarded against waste, loss, unauthorized use and misappropriation;
- revenues and expenditures applicable to agency operations are recorded and accounted for properly so that accounts and reliable financial and statistical reports may be prepared and accountability of the assets may be maintained; and
- programs are efficiently and effectively carried out in accordance with applicable law and management policy.

The concept of reasonable assurance recognizes that the cost of management control should not exceed the benefits of reducing risks to meeting program objectives; judgments are required to assess costs and benefits; errors or irregularities may occur and not be detected because of inherent limitations resulting from resource constraints, congressional restrictions, and other factors; and projection of an evaluation to future periods is inappropriate because of the likelihood of changes in conditions or degree of compliance.

The results of the review of this program indicate that the system of management controls in effect at this time, taken as a whole, complies with the requirement to provide reasonable assurance that management control objectives were achieved within the limits described above. However, corrective action is necessary to strengthen management controls in one of the activities reviewed as part of the Technical Assessment Capability Event Cycle. Attachments to this memorandum identify this concern, specify a corrective action, and provide a time frame for completion.

No review was performed for the Assessable Unit designated High-Level Waste Repository (Licensing), listed in your March 26, 1993, Memorandum "Risk Assessments," which contained the single Event Cycle Technical Assessment Capability for Repository Licensing Reviews. Technical Assessment Capability is one of the Event Cycles within the Assessable Unit High-Level Waste Repository (Prelicensing), and this capability is being developed during the current prelicensing phase to support possible future license reviews.

The review of actions taken to correct weaknesses from past Management Control Reviews, which was requested by your August 19, 1993, Memorandum to Robert Bernero, is provided as Exhibit E.

/s/

B. J. Youngblood, Director
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards

Attachments:
Exhibit A--List of Event Cycles
Exhibits B1 & B2--Flow Charts plus narrative documentation
Exhibits C1 & C2--Lists of Management Controls and
Risk Worksheets
Exhibits D1 & D2--Testing of Management Controls
Exhibit E--Corrective Actions

cc: Robert M. Bernero, NMSS

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List of Event Cycles Within Programs and Administrative Functions

Office/Region: NMSS / HQ **Assessable Unit:** High-Level Waste Repository (Pre-licensing)

Event Cycles	Comments
NUCLEAR REGULATORY REQUIREMENTS & TECHNICAL GUIDANCE RULES & AMENDMENTS SUPPORT FORMAT & CONTENT GUIDE SUPPORT TOPICAL GUIDELINES REG GUIDE SUPPORT PREPARE TECHNICAL/STAFF POSITIONS NWPA, NWPAA MANDATED/ SUPPORT ACTIONS INTERNATIONAL PROGRAM COORD.	This Event Cycle was not evaluated. Preparation of Technical Staff Positions was evaluated in September 1988, as a sample for this Event Cycle, and weaknesses identified have been corrected (see text for details).
TECHNICAL ASSESSMENT CAPABILITY REVIEW PLAN PREPARATION ANALYSIS METHOD PREPARATION ITERATIVE PERF. ASSESSMENT	This Event Cycle was evaluated (see text for details).
QUALITY ASSURANCE QA REVIEW PLAN PREPARATION INSPECTION PGM DEVELOPMENT DOE QA REVIEWS & AUDITS DOE QA ON-SITE VISITS HLWM INTERNAL QA NEVADA QA REVIEWS & AUDITS	This Event Cycle was not evaluated. The major activity, DOE QA Reviews and Audits was reviewed in September 1988 and determined to be satisfactory. HLWM Internal QA is discussed as validation of management control techniques.

Kenneth Hooks/SAIC Kenneth Hooks 9/24/93

Prepared by John T. Buckley (Name/Title) John T. Buckley (Signature) **Date** 9/24/93

Reviewed by B. J. YOUNGBLOOD (Name/Title) B. J. Youngblood (Signature) **Date** 9/24/93

List of Event Cycles Within Programs and Administrative Functions

Office/Region: NMSS / HQ **Assessable Unit:** High-Level Waste Repository (Pre-licensing)

Event Cycles	Comments
SITE CHARACTERIZATION REVIEWS SCP PROGRESS REPORT REVIEWS DOE STUDY PLAN REVIEWS REPOSITORY TECH RPT REVIEWS MAJOR DESIGN RPT REVIEWS TOPICAL REPORT REVIEWS WASTE ACCEPTANCE RPT REVIEWS LA ANNOTATED OUTLINE REVIEWS DOE IPA REVIEWS ON-SITE REPRESENTATION	All activities under this Program Element/Event Cycle are a form of technical document review, with the exception of On-site Representation, which will not be evaluated. The event cycle was evaluated as a generic document review cycle, with specific type(s) of review used as examples.
SYSTEMATIC REGULATORY ANALYSIS & CNWRA OPERATIONS SRA IMPLEMENTATION SRA SYSTEM DEV & OPERATION CNWRA OPERATIONS & PLANNING	This Event Cycle was not evaluated. CNWRA Operations and Planning is handled outside HLWM, and is currently being reviewed by the IG and the Center Review Group, on which HLWM is represented.

Kenneth R Hooks/DWM/SL Kenneth R Hooks 9/24/93

Prepared by John T Buckley (Name/Title) John T. Buckley (Signature) **Date** 9/24/93

Reviewed by B.J. Youngblood (Name/Title) B.J. Youngblood (Signature) **Date** 9-24-93

EXHIBIT B1

SUMMARY OF INTERNAL CONTROL REVIEW OF SITE CHARACTERIZATION REVIEWS EVENT CYCLE

Selection of Event Cycle

The first event cycle chosen for internal control review was Site Characterization Reviews (SCR). This event cycle was chosen because site characterization reviews are important pre-License Application (LA) activities and accounts for a significant amount of the annual resource expenditures within the Division of High-Level Waste Management (HLWM).

General Control Environment

An analysis of the general control environment in HLWM was conducted as part of the risk assessment completed on April 14, 1993. Management control conditions have not changed significantly over the past six months, and therefore, the previous analysis is still valid.

Documentation of the Event Cycle

An understanding of the event cycle was obtained by interviewing HLWM staff and reviewing the "Overall Review Strategy for the Nuclear Regulatory Commission's High-Level Waste Repository Program," (hereafter Overall Review Strategy (ORS)) dated February 1993. The ORS guides the specific planning for reviews, review capability development, and research to support the annual Five-Year Plan and Budget preparation. Specifically, SCRs include: (1) Site Characterization Plan (SCP) Progress Report reviews; (2) Study Plan Reviews; (3) Repository Technical Report reviews; (4) major design report reviews; (5) Topical Report reviews; (6) Waste Acceptance Report reviews; (7) LA Annotated Outline reviews; and (8) Performance Assessment (PA) reviews. The basic steps involved in SCRs are shown in Figure 1.

Each of the steps identified in the flowchart have internal controls associated with them. Internal controls come in the following forms: (1) Documents released for review by a manager or project manager per procedure; (2) Scope, review criteria and staff responsibilities provided in procedures; (3) Managerial responsibility for assignment of reviewers and supervision/review of their activities provided in procedure; (4) Managerial review of comment packages; (5) Placement of package comments in Public Document Room (PDR) and updating the Open Item Tracking System (OITS); (6) Expected resources planned/documented in HLWM Operating plans/budgets; and (7) Criteria for review of draft documents presented in WM Policy Memo #44. The management control techniques are implemented through the steps identified on Exhibit C1. Documentation of the event cycle includes; ORS, document review procedures, and publicly documented review results.

Evaluation of the Management Controls Within the Event Cycle

Identify the Goals and Objectives of the Event Cycle and the Risks Associated with Each Goal or Objective

The one primary goal pertaining to this event cycle is: Conduct efficient and effective reviews of U.S. Department of Energy (DOE) site characterization documents to identify concerns that might be potential licensing issues and comment on DOE's resolution of these concerns to help ensure that DOE submits a complete and high quality LA. The risks associated with this goal are as follows:

1. Inadequate review (does not identify NRC concerns);
2. Inefficient use of resources;
3. Inadequate documentation of review activities;
4. Review of inappropriate/draft documents.

As stated on the Risk Worksheet (see Exhibit C1), the chance and consequence associated with these risks is: Risk 1 - low and high respectively; Risk 2 - low and low respectively; Risk 3 - medium and medium respectively; and Risk 4 - medium and low respectively.

Ascertain the Management Control Objectives for the Event Cycle.

The management control objectives identified on Exhibit C1 are correlated to the risks identified on the Risk Worksheet of Exhibit C1. For each risk identified there is a corresponding control objective. Consequently, the following control objectives were identified:

1. Ensure technically and programmatically adequate reviews;
2. Ensure reviews are focused and performed by appropriate personnel in an efficient manner;
3. Ensure adequate documentation is retained to support possible licensing;
4. Ensure reviews are performed only on DOE-approved documents as required.

Examine the Documentation of Existing Management Control Techniques

The purpose of this portion of the Management Control Review is to identify the management control techniques necessary to meet the management control

objectives of the event cycle. The evaluation of the management control techniques within the event cycle included a review of the following major documents produced from this event cycle: (1) ORS; and (2) a sample of several document review procedures.

From the review of the documentation associated with this event cycle, the evaluators identified the presence of the following management control techniques: (1) Review criteria and staff responsibilities provided in procedures; (2) Managerial review of comment packages; (3) Supervisors assign reviewers and supervision/review of their activities provided in procedure; (4) Expected resources planned/documented in HLWM Operating plans/budgets; (5) Requirements for document retention and placement of package comments in Public Document Room (PDR) defined in procedures; (6) Criteria for review of draft documents presented in WM Policy Memo #44; and (7) Documents released for review by a manager or project manager per procedure.

Determine the Adequacy of Management Control Techniques

It appears that this event cycle as depicted in Figure 1 contains appropriate management control techniques to provide reasonable assurance that the control objectives can be met. Implementation of the control techniques will be covered in a later section of the report. A listing of the management control objectives and control techniques is presented in Exhibit C1.

As indicated on Exhibit C1, the level of control is determined to be strong. The reason for the strong ratings is the presence of, and detail incorporated into, the management control documents examined. In February 1993, HLWM published the ORS which provides overall policy guidance to the NRC staff in conducting its LA and pre-LA reviews in support of the Commission's construction authorization decision for a geologic repository for the disposal of high-level waste (HLW). Strong management controls are also present in the form of staff procedures used to conduct the SCRs. Review procedures are frequently evaluated and revised to streamline the review process. A continual refinement to improve the efficiency of the review procedures is demonstrated by the declining number of staff hours required to conduct the average review. A further indication that the management control techniques are strong is that the review results continue to be accepted by DOE and other program participants.

Testing of the Management Controls

Testing the implementation of the management control techniques present in this event cycle was accomplished by selecting two test cases for detailed examination. The two cases chosen to determine whether the controls are functioning as intended were; (1) NRC staff review of DOE Site Characterization Plan Progress Reports (SCPPR); and (2) NRC staff review of DOE Study Plans (SP).

Test Case #1 - NRC Staff Review of DOE SCPPRs

An understanding of the activity was obtained by interviewing HLWM staff and reviewing the "Review Plan for NRC Staff Review of DOE Site Characterization Plan Progress Reports" (SCPPR RP).

Evaluation of the Management Controls

Draft procedures were reviewed by management for adequate controls prior to issuance. Procedures control the scope, assign responsibility, specify review process and documentation required. Further revisions of the procedures are based on use, audits, etc. The review steps described in the SCPPR Review Plan are sufficient and adequately implemented to provide reasonable assurance that the HLWM program goals are effectively achieved in accordance with applicable laws and management policy.

The specific management objectives or goals associated with the NRC staff review of the SCPPRs are:

1. Evaluate the progress, results, and changes DOE has made in its site characterization program;

2. Identify new concerns related to the progress, results, and changes DOE has made in its site characterization program;

3. Evaluate material related to potential resolution of existing NRC concerns being tracked in the Open Item Tracking System (OITS);

4. Identify any other observations or recommendations regarding the technical or programmatic information in the SCPPRs that could provide regulatory guidance to DOE;

5. Document review results in a review package for transmittal to DOE;

6. Enter new concerns and progress toward resolution of existing concerns into the OITS.

7. Transmit review package to DOE within three months of NRC's receipt of an SCPPR.

These seven specific objectives are embodied within the management control objectives identified for the event cycle on Exhibit C1. For example, management objectives one through four above correspond to event cycle management control objective number one.

The major risk associated with the objectives listed above is the potential for not identifying significant technical concerns related to the progress, results and changes DOE has made in its site characterization program within the three month turn around time for the comment packages.

Evaluation of Management Control Techniques

A majority of the management control techniques identified on Exhibit C1 are implemented in the details of the SCPPR Review Plan (RP). The SCPPR RP identifies the internal quality assurance (IQA) records which must be retained to document the review process. These IQA records serve as objective evidence that the management control techniques have been adequately implemented.

An internal surveillance of the SCPPR No. 5 review process was completed on September 28, 1992 by members of the HLWM Quality Assurance (QA) staff. The surveillance report concludes that the SCPPR RP has been effective in assuring the quality and consistency of the SCPPR reviews, and that the Review Plan was effectively implemented although there were several minor deficiencies. The surveillance report provided the following recommendations for improving the review process:

1. Revise the SCPPR RP to clarify requirements and require better documentation of some actions (i.e. IQA checks, requests for assistance);

2. Better integrate the IQA Coordinator into all stages of the review process;

3. Revise the SCPPR RP to include distinctions between objections, comments, and questions.

A revision of the SCPPR RP is currently in process. This revision incorporates the above recommendations. An IQA surveillance will be conducted at an appropriate time to verify the effectiveness of these corrective actions. Based on the results of this surveillance, the management control techniques in place for the review of SCPPRs appear to be adequate and effectively implemented and thus has satisfied the management control objectives.

Test Case #2 - NRC Staff Review of DOE Study Plans

An understanding of the activity was obtained by reviewing the "Review Plan for NRC Staff Review of DOE Study Plans."

Evaluation of Management Controls

Draft procedures were reviewed by management for adequate controls prior to issuance. Procedures control the scope, assign responsibility, specify review process and documentation required. Further revisions of the procedures are based on use, audits, etc. The review steps described in the Study Plan (SP) Review Plan (SPRP) are sufficient and adequately implemented to provide reasonable assurance that the HLWM program goals are effectively achieved in accordance with applicable laws and management policy.

Specifically, the management objectives associated with the review of DOE SPs are:

1. Determine whether the content of the study plan is substantively consistent, as appropriate for the activities, tests, and analyses described, with the "1993 DOE/NRC Level of Detail and Review Process Agreement for Study Plans" (hereafter Agreement).

2. Evaluate whether the objectives of the study plan are clearly stated and are consistent with those proposed in the investigation plan presented in the SCP and whether the objectives of the SP are technically defensible in the context of the overall site characterization program.

3. Assess whether the activities, tests, and analyses presented in the study plan could have significant unmitigable adverse effects on the waste isolation capabilities of the site.

4. Evaluate, to the extent possible based upon the SCP and available study plans, whether the activities, tests, and analyses presented in the study plan could significantly interfere with or be interfered with by other site characterization testing and/or construction of the exploratory studies facility (ESF) such that the ability to obtain information needed for licensing is precluded.

5. Determine whether the study plan was developed under an acceptable QA program and whether it references a QA program that is in place and accepted by NRC to provide assurance that the activities, tests, and analyses comprising the study plan can produce data of demonstrably high quality usable for licensing.

6. Evaluate whether the proposed use (if any) of radioactive materials in testing is necessary to obtain the information that the study is designed to obtain.

7. For any study plan requiring detailed technical comments, evaluate the extent to which the activities, tests, and analyses presented in the study plan will enable DOE to obtain the information for licensing that the study is designed to obtain and that it should obtain.

8. If DOE has proposed that one or more NRC open items be resolved on the basis of the material in the study plan, determine whether those items can be closed and prepare an evaluation of the information provided by DOE to resolve the open item(s).

9. Document review results in a review package for transmittal to DOE. For any study plan requiring detailed technical comments, document comments. Detailed technical comments may be submitted as a separate package.

10. Enter new concerns and progress toward resolution of existing concerns into the OITS.

Although these specific management objectives are not identical to the management control objectives identified on Exhibit C1 the specific objectives are embodied within the event cycle objectives. The risk associated with the objectives listed above is the potential for not identifying significant concerns with DOE's implementation of the site characterization program designed to resolve the issues related to regulatory requirements that DOE identified in the SCP.

Evaluation of Management Control Techniques

Evaluation of the management control techniques utilized to insure that the objectives are met is accomplished by reviewing the IQA records which become part of the public record. The following records comprise the IQA record:

1. SPRP;

2. Signed review package(s) transmitted by the Branch Chief to the Project Director;

3. Review package transmitted by the Project Director to DOE;

4. Certifications by signatures of the appropriate Section Leader(s) and Branch Chief(s) of total or partial resolution of NRC open items as a result of the review of the study plan.

The management control techniques established within HLWM are adequate for the review of the SPs based upon use as described under Testing of the Management Controls. The IQA records identified above document that each of the Management control objectives are met. Retaining a copy of the SPRP insures that the review process is documented. Signed review packages insure that the technical staff and their management are satisfied that the comments generated are technically accurate, defensible and management supported. A transmittal letter of the final review package by the Project Director insures that the final package is consistent with the objective of the event cycle.

An internal audit was completed on two study plan reviews on July 15, 1991 by members of the HLWM QA staff. The audit report concludes that the study plan review process generally conforms to the procedural requirements as stated in the draft review plan. The audit revealed deficiencies in two areas. First, the staff did not prepare or retain some necessary written records. Second, although the SPRP requires various records to be placed in the OITS, the OITS was not operational at the time of the audit.

HLWM took action to close-out the two audit findings described above. The following actions were proposed to better control the review of DOE study plans:

1. Revise the SPRP with the help of QA Section to more accurately reflect the types of documentation that should be required during SP reviews.

2. Detailed training sessions should be held during the Yucca Mountain Team Meetings to inform the staff reviewing SPs of the QA procedural requirements.

3. The SPRP should be revised to state that concerns identified during SP reviews will be tracked in the OITS when it becomes operational.

4. Another audit of the SP review process should be performed after several SPs have been reviewed to Revision 2 of the SPRP.

Revision 2 of the SPRP which incorporates these changes was issued on March 4, 1993. An internal audit or surveillance will be performed at the appropriate time to verify implementation of the corrective actions.

Identification of Material Weaknesses

The reviewers have identified no material weaknesses in the HLW program in the areas that were evaluated. The program weaknesses that were identified through the IQA audit do not meet the criteria for material weaknesses as described in the Management Control Review Instructions.

Recommendations for Corrective Action

No corrective action is required.

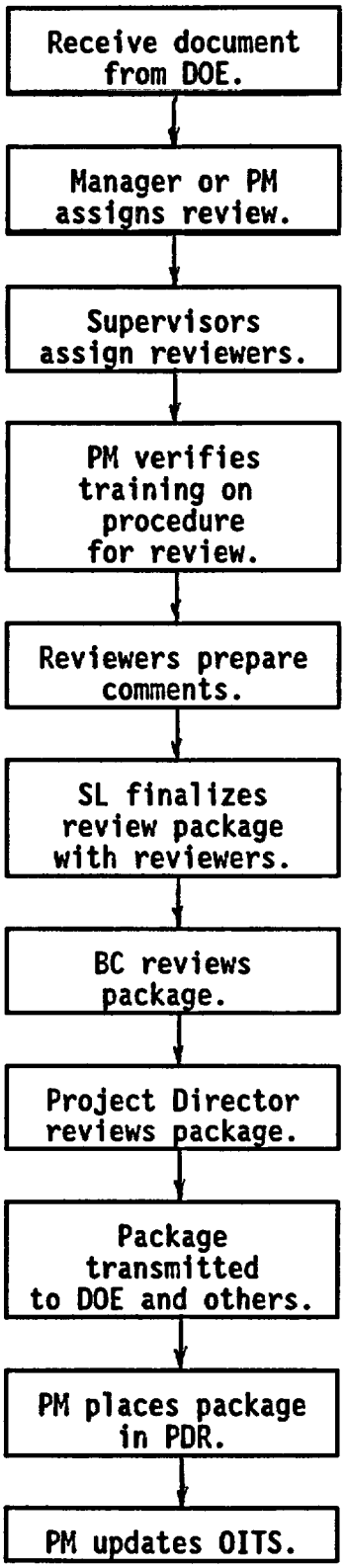

FIGURE 1. SITE CHARACTERIZATION REVIEW

LIST OF MANAGEMENT CONTROLS				
Office/Region: NMSS/HQ		**Assessable Unit:** HLWM		
Event Cycle: Site Characterization Reviews (Technical Report Reviews)				
Risks What Could Go Wrong?	**Management Control Objectives**	**Management Control Techniques**	**Strong (S) Weak (W) Excessive (E) Missing (M)**	**Comments Concerns**
(1) Inadequate review does not identify NRC concerns	Ensure Technically and Programmatically adequate review.	Review scope, criteria and responsibilities provided in procedure(s). Managerial review of comment packages.	Strong	Development of procedures through successive reviews and revisions of the procedures. Management review of results and internal audits confirm adequacy of controls. The comments produced by reviews have been accepted by DOE, the State of Nevada, and others. Reviews have been focussed, and the staffhours required for average review have been declining.
(2) Inefficient use of resources	Ensure review is focused and is performed by appropriate personnel in efficient manner.	Responsibility for assignment of review personnel and supervision/review of their activities provided in procedures. Expected resources planned/documented in operation plans/budgets.	Strong	Reviews have been focussed, and the staffhours required for average review have been declining.

EXHIBIT C1

LIST OF MANAGEMENT CONTROLS				
Office/Region: NMSS/HQ		**Assessable Unit:** HLWM		
Event Cycle: Site Characterization Reviews (Technical Report Reviews)				
Risks What Could Go Wrong?	**Management Control Objectives**	**Management Control Techniques**	**Strong (S) Weak (W) Excessive (E) Missing (M)**	**Comments Concerns**
(3) Inadequate Documentation of review activities	Ensure adequate documentation is retained to support possible licensing.	Requirements for document retention and placement of information in PDR are defined in procedures.	Strong	Management review of results and internal audits/reviews confirm adequacy of documentation requirements.
(4) Review of inappropriate/draft documents	Ensure reviews are performed only on DOE-approved documents as required.	Criteria for review of draft documents in WM Policy Memo NO. 44. Documents released for review by Management or Project Manager per procedures.	Strong	All DOE requests for review go through Management/Project Management. Priorities established prior to start of work.

Kenneth R Hooks / QASL — Kenneth R Hooke — 9/24/93

Prepared by: (Name/Title) John T. Buckley Signature: John T. Buckley Date: 9/24/93

Reviewed by: (Name/Title) B.J. YOUNGBLOOD Signature: B.J. Youngblood Date: 9-24-93

RISK WORKSHEET

Office/Region: NMSS/HQ **Assessable Unit:** Division of High-Level Waste Management (HLWM) [High-Level Waste Repository(Prelicensing)]

Event Cycle: Site Characterization Reviews

WHAT IS THE COMPONENT'S OBJECTIVE? Ensure adequate, efficient, documented reviews

RISK--WHAT COULD GO WRONG? WHAT HAS GONE WRONG?	CHANCE H	CHANCE M	CHANCE L	CONSEQUENCE H	CONSEQUENCE M	CONSEQUENCE L
1. Inadequate technical/programmatic reviews			X	X		
2. Inefficient review process.			X			X
3. Failure to adequately document reviews.		X			X	
4. Review of inappropriate/draft documents.		X				X
5.						
6.						
7.						
8.						
9.						
10.						

H - High, M - Medium, L - Low

Prepared by Kenneth R. Hooks/DWM/ASL John T. Buckley (Name/Title) — John T. Buckley (Signature) — Date 9/24/93 9/24/93

Reviewed by B.J. YOUNGBLOOD (Name/Title) — B.J. Youngblood (Signature) — Date 9-24-93

EXHIBIT D1

Testing of Management Controls

Office/Region: NMSS/HQ **Assessable Unit:** HLWM
Event Cycle: Site Characterization Reviews

Necessary Control Techniques	Functioning (Yes or No)	Adequate (Yes or No)	Method of Testing, Comments and Recommendations
Scope, review criteria and responsibilities provided in procedure(s).	Y	Y	Testing for this event cycle was accomplished by selecting two major activities within the event cycle and then evaluating the implementation of the necessary management controls. (See write-up for more detailed information).
Responsibility for assignment of review personnel and supervision/ review of their activities provided in procedures.	Y	Y	
Expected resources planned/documented in Operation Plans/ Budgets.	Y	Y	
Requirements for document retention defined in procedures.	Y	Y	
Criteria for review of draft documents in WM Policy Memo #44. Documents released for review by Management or Project Manager per procedures.	Y	Y	
Managerial review of comment packages.	Y	Y	

Prepared by John T. Buckley (Name/Title) John T. Buckley (Signature) Date 9/24/93

Reviewed by B.J. YOUNGBLOOD (Name/Title) B.J. Youngblood (Signature) Date 9-24-93

EXHIBIT B2

SUMMARY OF INTERNAL CONTROL REVIEW OF NRC STAFF REVIEW OF TECHNICAL ASSESSMENT CAPABILITY EVENT CYCLE

Selection of Event Cycle

The second event cycle chosen for internal control review was Technical Assessment Capability (TAC). This event cycle was chosen because the development of a technical assessment capability is an important element of the overall license application (LA) review strategy and accounts for a significant amount of the annual resource expenditures within the Division of High-Level Waste Management (HLWM).

General Control Environment

An analysis of the general control environment in HLWM was conducted as part of the risk assessment completed on April 14, 1993. Management control conditions have not changed significantly over the past six months, and therefore, the previous analysis is still valid.

Documentation of the Event Cycle

An understanding of the event cycle was obtained by interviewing HLWM staff and reviewing the "Overall Review Strategy for the Nuclear Regulatory Commission's High-Level Waste Repository Program," (hereafter Overall Review Strategy (ORS)) dated February 1993. The ORS provides the overall policy that guides the specific planning for reviews, review capability development, and research to support the annual Five-Year Plan and Budget preparation. Specifically, review capability activities include the development of: (1) the License Application Review Plan (LARP) using the principles of Systematic Regulatory Analysis (SRA); and (2) performance assessment (PA) models and codes both of which will be used to evaluate the U.S. Department of Energy's (DOE) demonstration of compliance with 10 CFR Part 60. The steps involved in planning the development of LA review capability during the pre-LA phase are shown in the flowchart, Figure 1.

Each of the steps identified in the flowchart have internal control associated with them. Internal controls come in the following forms: (1) Long Range Technical Assessment Strategic Plans, such as PA Strategic Plan; (2) short term development plans; (3) yearly updates to the HLWM Operating plans; and (4) Individual Management plans for technical program areas. The management controls listed on Exhibit C2 are identified on the flowchart. Documentation of the event cycle includes; LARP and associated SRA documents, "IPA Program Plan for Phase 2 Iterative Performance Assessment Activities to be conducted jointly by NMSS, RES, and CNWRA," and various internal quality assurance (IQA) documents.

Evaluation of the Management Controls Within the Event Cycle

Identify the Goals and Objectives of the Event Cycle and the Risks Associated with Each Goal or Objective

The one primary goal pertaining to this event cycle is: To provide for an effective and efficient licensing process by developing methods to permit the independent determination of the acceptability of DOE pre-licensing and licensing information. The risks associated with this goal are as follows:

1. Inefficient use of resources by failing to develop adequate technical assessment capability;

2. Lack of assessment capability for pre-licensing reviews and at time of LA review;

3. Inadequate documentation of assessment capability at time of LA review.

As stated on the Risk Worksheet, the chance associated with each of these risks is low, while the consequence of each risk is determined to be medium, high, and high respectively.

Ascertain the Management Control Objectives for the Event Cycle

The management control objectives identified on Exhibit C2 are correlated to the risks identified on the Risk Worksheet of Exhibit C2. For each risk identified there is a corresponding control objective. Consequently, the following control objectives were identified:

1. Optimize resource expenditures in development of technical assessment capability during pre-LA phase;

2. Develop technical assessment capability during pre-LA phase to allow for efficient pre-licensing consultation and review of LA;

3. Assure adequate documentation of technical assessments to support NRC findings in the licensing process.

Examine the Documentation of Existing Management Control Techniques

The purpose of this portion of the Management Control Review is to identify the management control techniques necessary to meet the management control objectives of the event cycle. The evaluation of the management control techniques within the event cycle included a review of the following major documents produced from this event cycle: (1) ORS; (2) a sample of several Compliance Demonstration Strategies (CDSs) and Compliance Determination Methods (CDMs). Because the Iterative Performance Assessment (IPA) Phase 2 Report is still in preparation, it was not available for review. However,

the IPA process, which is one of the technical analysis methods being developed was included in this evaluation due to its programmatic importance even though it is in a developmental phase.

From the review of the documentation associated with this event cycle, the evaluators identified the presence of the following management control techniques: (1) Documented long range technical assessment strategic plans which meet the objectives of the ORS; (2) Documented procedures for the development of technical assessment capabilities (i.e. LARP, IPA, SRA); (3) Systematic identification of technical issues requiring development of models and codes; (4) Technical team reviews and focused management reviews; (5) Program planning documents; (6) Retention of information in data bases; and (7) Issuance of reports documenting completed work.

Determine the Adequacy of Management Control Techniques

It appears that this event cycle contains the appropriate management control techniques to provide reasonable assurance that the control objectives can be met. However, this is not to say that implementation of the control techniques is appropriate. This topic will be covered in a later section of the report. A listing of the management control objectives and control techniques is presented on Exhibit C2.

As indicated on Exhibit C2, the level of control is determined to be strong. The reason for the strong ratings is the presence of, and detail incorporated into, the management control documents examined. In February 1993, HLWM published the ORS which provides overall policy guidance to the NRC staff in conducting its LA and pre-LA reviews in support of the Commission's construction authorization decision for a geologic repository for the disposal of HLW. In addition, it generally describes the strategy for developing the LA and pre-LA review capability. These strategies for review and development of review capability both contribute to a more effective and efficient LA review process. Strong management controls are also present in the form of: (1) systematic identification of technical issues requiring development of models and codes; (2) continuing technical team reviews and focused management reviews; and (3) staff procedures used to develop technical assessment capability. For instance, CDS development is controlled by yearly LARP develoment plans and Center for Nuclear Waste Regulatory Analyses (CNWRA) Technical Operating Procedure (TOP) - 011. IPA Phase 2 activities are controlled by the "Program Plan for Phase 2 Iterative Performance Assessment Activities to be Conducted Jointly by NMSS, RES, and CNWRA," which was published in December 1991 and CNWRA TOP-018.

Testing of the Management Controls

Testing the implementation of the management control techniques present in this event cycle was accomplished by selecting two test cases for detailed examination. The two cases chosen to determine whether the controls are functioning as intended were; (1) CDS development, and (2) IPA Phase 2.

Test Case #1 - NRC Staff Development of Compliance Determination Strategies

An understanding of this activity was obtained by reviewing the CNWRA Technical Operating Procedure (TOP) -001-11: Development of Compliance Determination Strategies, Revision 1, January 18, 1993. All of the controls which make up this activity are described in TOP-001-11. Therefore, the internal control review focused on the use and implementation of TOP-001-11. There are numerous internal controls contained in TOP-001-11. Documentation requirements for the activity are detailed in the Records section of TOP-001-11. Examples of records which must be retained include; (1) CDSs, (2) review documentation developed by the CNWRA, and (3) review documentation developed by HLWM.

Evaluation of the Management Controls

Drafts of procedures used to prepare CDSs were reviewed by management for adequate controls prior to issuance. Planning for CDS development is controlled by the annual LARP development plan. Procedures control the scope, assign responsibility, specify review process and documentation required. Further revisions of the procedures are based on use, audits, etc. The review steps described in TOP-001-11 are sufficient and adequately implemented to provide reasonable assurance that the program goals are effectively achieved in accordance with applicable laws and management policy.

HLWM is conducting a SRA in support of the high-level waste licensing program. The first step in the SRA is the development of Regulatory Requirement Topics (RRTs). A RRT is a set of one or more regulatory requirements pertaining to a topic of regulatory interest. The resulting number of RRTs and the limited quantity of staff time and resources necessitate an evaluation of the level of resources to be applied to examining compliance with each of the RRTs based on technical urgency and difficulty, risk of non-compliance with repository performance objectives and other factors. Each CDS establishes the scope and depth of the NRC compliance determination review for a RRT. The CDS controls the preparation of the CDM for that RRT by defining any limits on the type and extent of the license application review. Portions of the CDSs and CDMs will be included in the LARP for the Yucca Mountain site.

The process of CDS development results in the definition of key technical uncertainties (KTUs). These KTUs will be used to define modeling and research user needs and ultimately result in the initiation of both HLWM and Office of Nuclear Regulatory Research (RES) programs. The two main steps in CDS development are; (1) selection of review types, and (2) review strategy preparation. Development of the CDSs and their incorporation into the LARP is an iterative process. It includes a review of the applicable portion of the Format Content and Review Guide (FCRG) to ensure consistency, feedback from ongoing staff work, and recognition of DOE program activities.

The goals of SRA, which include CDS development, are:

1. Focus and coordinate the staff's efforts to develop a well-integrated review capability consisting of review plans supported, as appropriate, by the staff's independent analytical methods and results of research investigations;

2. Improve the basis for the staff's pre-LA reviews and resulting guidance to DOE regarding a complete and high quality LA;

3. Ensure the quality, consistency, effectiveness, and efficiency of the LA review;

4. Ensure integration of the complex LA review by documenting interfaces among all of the review plans making up the LARP;

5. Complete the LA review within the 18 month period necessary to support the three-year statutory time period for licensing.

These objectives are embodied within the management objectives of the event cycle and documented on Exhibit C2.

The major risks associated with the development of CDSs is the potential for identification of an incorrect review type (priority) for a given RRT, identification of incorrect user needs resulting in the initiation of unnecessary modeling or research programs, and inadequate preparation for conducting the LA review. These risks are similar to the risks associated with the event cycle.

Evaluation of Management Control Techniques

Documentation of long range technical assessment strategic plans is identified on Exhibit C2 as an important control technique. The planning document describing the LARP development process is the LARP development plan that implements the ORS.

Exhibit C2 identifies documented procedures as another major management control technique. CDS development was conducted in accordance with the CNWRA TOP-001-11, which is the procedure for controlling the CDS work. One of the functions of the management reviews of CDS preparation was an evaluation to ensure compliance with the procedures. A more formal evaluation activity for FY94-95 will be a CNWRA surveillance of the CDS development process. Finally, a version of the LARP will be issued every year to document the work completed in this area.

Documentation that the above management control techniques have been met can be found in the quality assurance (QA) records which become part of the public record. The following records comprise the QA record:

1. CDSs;

2. Review documentation developed by the CNWRA as a result of conducting CDS related activities;

3. Review documentation developed by HLWM as a result of conducting CDS related activities shall be provided to the CNWRA for maintenance as QA records.

The management control techniques established within HLWM are adequate for the development of CDSs based upon use as described under Testing of the Management Controls. The QA records identified above document that the CDS development process is adequately documented for traceability. NRC and CNWRA management briefings in the early stages of development assure that consistency is maintained within and between technical disciplines.

Test Case #2 - IPA Phase 2

An understanding of the IPA Phase 2 activities was obtained by interviewing HLWM staff and reviewing the "Program Plan for Phase 2 Iterative Performance Assessment Activities to be Conducted Jointly by NMSS, RES and CNWRA," dated December 1991 (hereafter called IPA Program Plan). The IPA Program Plan documents the anticipated activities required for the completion of IPA Phase 2. Therefore, the detailed evaluation of IPA Phase 2 focused on the use and implementation of the IPA Program Plan.

Evaluation of the Management Controls

The IPA Program Plan states that the overall objective of the IPA activity at the NRC is to develop, maintain, and enhance the NRC staff capability to do an effective review of DOE's high-level waste (HLW) performance assessments in its application for HLW disposal. In addition, the IPA Program Plan lists the following secondary objectives:

1. Support the development of regulatory guidance and the LARP, especially in developing and refining the basis for the review strategies and review methods for the performance objectives;

2. Provide practical insights into the feasibility of implementing existing requirements of 10 CFR Part 60 and 40 CFR Part 191, and the alternatives that might be considered;

3. Support the pre-LA reviews of DOE's site characterization program (including field and laboratory studies, early PAs and performance allocations, and design analyses).

4. Provide the means to acquire and evaluate the Tuff Performance Assessment Methodology developed by Sandia National Laboratories (SNL) under contract to NRC.

These objectives contain the basic elements of the management objectives for the event cycle documented on Exhibit C2.

Evaluation of Management Control Techniques

The first control technique identified on Exhibit C2 is the documentation of long range technical assessment strategic plans. There are several PA strategy planning documents which lay the foundation for IPA Phase 2. The most important planning documents include ORS, Post-Closure PA Strategy, and the PA Management Plan.

The IPA Program Plan is the overall plan for the conduct of IPA Phase 2 and is one of the ways HLWM is implementing the management control techniques identified on Exhibit C2. It contains detailed techniques for controlling the IPA activities. Detailed controls present in the IPA Program Plan include;

1. Description of IPA organization structure,
2. Task descriptions, scope & responsibilities,
3. Work Breakdown Structure, and
4. Task completion schedules.

Additional management controls were provided in the HLWM Operating Plan and the CNWRA Operating Plan. Although the IPA Program Plan contains the above noted management controls, the inclusion of procedures which controls such things as staff training requirements, documentation requirements, and software quality assurance (SQA) requirements would greatly increase the probability of meeting the management control objectives. Recent management discussions have focused on the appropriate level of SQA requirements for IPA activities for CNWRA and NRC staff members. TOP-018 "Configuration Management of Scientific and Engineering Codes" has been implemented for configuration management of IPA software to ensure the integrity of these codes. NRC management has initiated an evaluation to determine what level of QA practices are appropriate for IPA activities. Upon completion of this activity, the appropriate procedures will be developed.

Although there is a lack of procedures in some areas of the IPA Phase 2 activities, the IPA organization structure has compensated for some of these weaknesses. For instance, management participation on the three member IPA Management Board has insured managements awareness and approval of ongoing activities thereby increasing the chances that staff resources are appropriate. Further, this management presence insures that inefficient resource expenditures for duplication of effort between HLWM, RES, and CNWRA is avoided.

Based on the review conducted of the management control techniques, it was determined that given the developmental nature of IPA Phase 2, the controls in place are adequate.

Identification of Material Weaknesses

The reviewers have identified no material weaknesses in the HLW program in the areas that were evaluated. The program weaknesses that were identified do not meet the criteria for material weaknesses as described in the Management Control Review Instructions.

Recommendations for Corrective Action

The reviewers would recommend as part of the planning of Phase 3 that the program plan be supplemented by detailed procedures in the specific areas noted above.

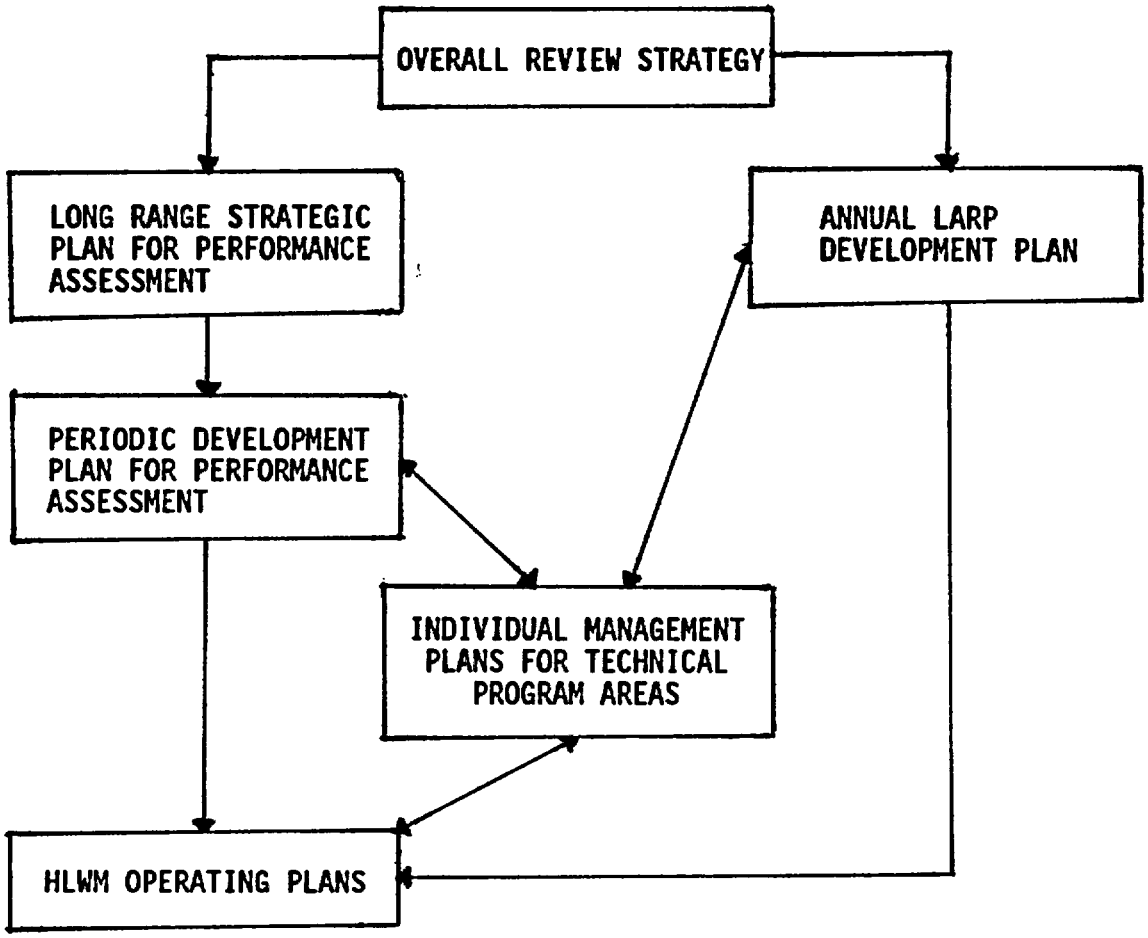
OVERALL REVIEW STRATEGY
LONG RANGE STRATEGIC PLAN FOR PERFORMANCE ASSESSMENT
ANNUAL LARP DEVELOPMENT PLAN
PERIODIC DEVELOPMENT PLAN FOR PERFORMANCE ASSESSMENT
INDIVIDUAL MANAGEMENT PLANS FOR TECHNICAL PROGRAM AREAS
HLWM OPERATING PLANS

FIGURE 1

LIST OF MANAGEMENT CONTROLS

Office/Region: NMSS/HQ **Assessable Unit:** HLWM (High-Level Waste Repository/Prelicensing)

Event Cycle: Technical Assessment Capabilities

Risks What Could Go Wrong?	Management Control Objectives	Management Control Techniques	Strong (S) Weak (W) Excessive (E) Missing (M)	Comments Concerns
(1) Inefficient use of resources by failing to develop adequate technical assessment capability.	Optimize resource expenditures in development of technical assessment capability during pre-LA phase.	Develop & document long range technical assessment strategic plans which meet the objectives of the Overall Review Strategy. Document procedures for the development of technical assessment capabilities (i.e., LARP, IPA, SRA).	Strong Strong (considering the developmental stages of activities)	See corresponding text.
(2) Lack of adequate assessment capability for prelicensing consultation and LA review.	Develop technical assessment capability during pre-LA phase to allow for efficient review of LA.	Systematic identification of technical issues requiring development of models and codes. Technical team reviews and focussed management reviews. Program planning documents.	Strong	

LIST OF MANAGEMENT CONTROLS

Office/Region: NMSS/HQ **Assessable Unit:** HLWM (High-Level Waste Repository/Prelicensing)

Event Cycle: Technical Assessment Capabilities

Risks What Could Go Wrong?	Management Control Objectives	Management Control Techniques	Strong (S) Weak (W) Excessive (E) Missing (M)	Comments Concerns
(3) Inadequate documentation of assessment capability at time of LA review.	Assure adequate documentation of technical assessments to support NRC findings in licensing process.	Retention of information in databases. Issuance of reports documenting completed work. Develop procedures/ procedural requirements for documentation of assessment capability.	Strong	

Prepared by: (Name/Title) Kenneth R Hooks/DASL John T. Buckley Signature: Kenneth R Hooks John T. Buckley Date: 9/25/93 9/24/93

Reviewed by: (Name/Title) B.J. YoungBlood Signature: B.J. YoungBlood Date: 9-24-93

RISK WORKSHEET

Office/Region: NMSS/HQ **Assessable Unit:** Division of High-Level Waste Management (HLWM) [High-Level Waste Management (Prelicensing)]

Event Cycle: Technical Assessment Capabilities

WHAT IS THE COMPONENT'S OBJECTIVE? To provide for an effective, and efficient licensing process by developing methods to permit the independent determination of the acceptability of DOE licensing information.

RISK--WHAT COULD GO WRONG? WHAT HAS GONE WRONG?	CHANCE H M L	CONSEQUENCE H M L
1. Inefficient use of resources by failing to develop adequate technical assessment capability.	_ _ X	_ X _
2. Lack of assessment capability at time of LA review.	_ _ X	X _ _
3. Inadequate documentation of assessment capability at time of LA review.	_ _ X	X _ _
4.	_ _ _	_ _ _
5.	_ _ _	_ _ _
6.	_ _ _	_ _ _
7.	_ _ _	_ _ _
8.	_ _ _	_ _ _
9.	_ _ _	_ _ _
10.	_ _ _	_ _ _

H - High, M - Medium, L - Low

Prepared by Kenneth R Hooks/BASL John T. Buckley (Name/Title) Kenneth R Hooks John T. Buckley (Signature) Date 9/24/93 9/24/93

Reviewed by B.J. YOUNGBLOOD (Name/Title) B.J. Youngblood (Signature) Date 9-24-93

EXHIBIT D 2

Testing of Management Controls

Office/Region: NMSS/HQ Assessable Unit: HLWM
Event Cycle: Technical Assessment Capabilities

Necessary Control Techniques	Functioning (Yes or No)	Adequate (Yes or No)	Method of Testing, Comments and Recommendations
Develop & document long range technical assessment strategic plans which meet the objectives of the Overall Review Strategy.	Y	Y	Testing for this event cycle was accomplished by selecting two major activities within the event cycle and then evaluating the implementation of the necessary management controls. (See write-up for more detailed information).
Document procedures for the development of technical assessment capabilities (i.e. LARP, IPA, SRA).	Y	Y	
Systematic identification of technical issues requiring development of models and codes.	Y	Y	
Technical team reviews & focused management reviews.	Y	Y	
Program planning documents.	Y	Y	
Retention of information in databases.	Y	Y	
Issuance of reports documenting completed work.	Y	Y	

Prepared by Kenneth R Hooks/JTB Kenneth R Hooks Date 9/24/93
John T. Buckley (Name/Title) John T. Buckley (Signature) 9/24/93

Reviewed by B.J. YOUNGBLOOD B.J. Youngblood Date 9-24-93
(Name/Title) (Signature)

EXHIBIT E

REVIEW OF ACTIONS TAKEN TO CORRECT WEAKNESSES FROM PAST MANAGEMENT CONTROL REVIEWS

On September 27, 1988 the Internal Control Committee (ICC) completed it's internal evaluation of: (1) the CDSCP Review; (2) the development of Technical Positions (TPs); and (3) the process for conducting Observation Audits of DOE' QA program. Based on this review, the ICC had 11 concerns regarding the development of TPs. As part of this management control review NMSS was requested, by letter from Funches to Bernero dated August 19, 1993, to review the actions taken to correct management control weaknesses identified in past reviews and ensure that the corrective actions taken actually resolved the weaknesses (concerns).

To validate the corrective actions, the interim change to Waste Management Policy #46 "Work Plan on the Development of Technical Positions," dated September 13, 1989, was reviewed to assure that ICC recommended changes were made.

The following text provides the citation of the ICC concern, as stated in the Work Item Tracking System which was attached to the August 1993 Funches to Bernero Memorandum, and our conclusions.

1. IC-0011 Streamline the process of preparing and approving point papers.

   Point Papers were used to provide comments on the CDSCP and SCP reviews. Point Papers are no longer utilized in the HLW program. Comments on SCP Progress Reports are prepared in accordance with the Review Plan for NRC Staff Review of DOE Site Characterization Plan Progress Reports dated August 10, 1990.

2. IC-0012 The procedure is to be issued in final form and the staff briefed ASAP.

   The Work Plan on the Development of TPs was issued in final form on October 3, 1988 with interim changes issued on September 13, 1989.

3. IC-0013 Correct inconsistency between responsibilities of GSPB and ENCNWRA branch chiefs.

   Section 3.3 of the Work Plan states that the Deputy Director is fully responsible for the overall management of the TP program. Therefore the inconsistency is resolved.

4. IC-0014 The procedure is to state how scopes for TP's will be reviewed prior to a recommendation to the Division Director.

Section 4.2 of the interim change outlines the scope development review meetings which take place prior to obtaining Division Director approval.

5. IC-0015 The Director, HLWM is to be added to the concurrence chain for the public comment draft on the scope of a TP.

Section 3.2 of the Work Plan requires the Director to concur on the Federal Register Notice covering the availability of the TP for public comment.

6. IC-0016 The procedure should be revised to make allowance for briefing the Director, NMSS, on the scope of a TP before final concurrence.

Although not explicitly stated, the Office Director is briefed whenever the Office Director wants to be briefed. Implicit in any of the Divisions work, the Office Director can be briefed at any time.

7. IC-0017 Someone (i.e., the deputy division director) is to be designated the responsible executive for the overall direction of TP development.

Section 3.3 of the Work Plan states that the Deputy Director is fully responsible for the overall management of the TP program. Therefore the inconsistency is resolved.

8. IC-0018 Management will monitor the development of TPs to assure that established procedures are followed.

A total of three TPs have been completed since the ICC weaknesses were identified and corrected by HLWM. HLWM plans to conduct an internal audit or surveillance on the TP development process to assess adequacy of procedural implementation.

9. IC-0019 The Director, NMSS should concur on the public comment draft of a TP, instead of waiting for the final.

The Office Director does not concur on Federal Register Notices. Since the public comment draft of a TP is submitted with a Federal Register Notice there is no basis for Office Director concurrence.

10. IC-0020 The reference to Senior PM on pages 6 and 14 of the procedure is to be corrected.

References to "Senior PM" were corrected.

11. IC-0021 The author of a draft TP is to be required formally to document the disposition of internal comment.

Section 4.4 of the procedure requires that resolution of internal staff comments be documented and maintained by the author for future reference.

12. IC-0022 The procedure is to explicitly state what Form 426 is, and its purpose.

Form 426 is reference and identified in Section 3.10 of the procedure.