Department of Energy
Washington, DC 20585

August 23, 1999

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW.
Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

The Department of Energy's Implementation Plan (deliverable 5.5.1(c)) for the Defense Nuclear Facilities Safety Board Recommendation 98-2 requires a decision report that documents the Nuclear Explosive Safety Study Group (NESSG) structure and membership.

I have decided to restructure the NESSG to include three emeritus members as summarized in the enclosed decision report. Along with this restructuring, I am taking steps to enhance the stature of the NESSG and its members. I have also decided to retain the approval authority of the NESS reports.

If you have questions, please contact me or have your staff contact Mr. Stan Puchalla at 301-903-5797.

Sincerely,

David E. Beck
Deputy Assistant Secretary
for Military Application and
Stockpile Management
Defense Programs

Enclosure

cc:
M. Whitaker, S-3.1

NUCLEAR EXPLOSIVE SAFETY STUDY GROUP (NESSG) RESTRUCTURING

On June 24, 1999, the Deputy Assistant Secretary for Military Application and Stockpile Management (DP-20) convened a NESSG Workshop as called for in the Department of Energy's (DOE) Implementation Plan for the Defense Nuclear Facilities Safety Board (Board) Recommendation 98-2, Sub-Recommendation 5. The workshop panel included Mr. David Beck (DP-20), Dr. Herbert Kouts and Dr. John Mansfield (Board members), Mr. Richard Glass (DOE/Albuquerque-Manager), Dr. James Turner (DOE/Oakland-Manager), Mr. Travis Hunsaker (DOE/Nevada-NES Program Manager), and Mr. Steven Goodrum (DOE/Amarillo Area Office-Manager). Representatives from the Mason & Hanger Corporation, the Lawrence Livermore National Laboratory, the Los Alamos National Laboratory, and the Sandia National Laboratories participated as observers and panel consultants.

Prior to the workshop, DP-20 and the Board staffs planned and coordinated the workshop agenda and developed topical discussion areas with six NESSG review options. The agenda was designed to meet two objectives: (1) understand the NESSG process and the issues identified in Board Recommendation 98-2 and (2) examine possible alternatives to the NESSG as suggested in sub-recommendation 5. A copy of the view graphs presented at the workshop are attached.

The workshop began with discussions that focused on the purpose and intent of the NESSG's function, membership, and operating processes with Drs. Kouts and Mansfield providing their perspectives. Separate presentations were provided to the workshop on the verification of the Department's understanding of the recommendation, the current NESSG program, the Albuquerque and Nevada Operations Offices perspectives, and comparison of the various NESSG review options (including external DOE safety review bodies). Following the briefings, the panel assessed the information presented and provided to DP-20 with additional observations regarding the NESSG independence, the organizational lines of reporting and processing, the membership criteria and selection, and the role of nuclear explosive safety with other nuclear explosive work functions.

Based on the input from the workshop and additional consultation involving the DP-20 staff, DOE field organizations, and the Board staff, DP-20 will implement the following measures to improve the NESSG review process. These measures were outlined during the DOE quarterly briefing to the Board on August 17,1999:

1. **Addition of Three Emeritus Members to the NESSG**

   Three emeritus members (consultants employed by the Department who possess varied technical expertise) will be added to the existing NESSG pool. They shall carry the same voting privileges as other NESSG members. At least two of the three emeritus members will participate in each NESSG review. The emeritus members will observe operations, briefings, deliberations, etc., along with the existing NESSG.

2. **NESSG Size**

   NESSG participants will be limited to the number needed for an effective review of the topic at hand. The NESS shall not consist of more than nine persons per review.

3. **Revision of Selection Criteria for NESSG Membership**

   The criteria for NESSG review assignments will include technical qualifications, skill mix, and an inquisitive personality. Although no organization will have more than one participant per review, no member will be assigned solely to represent an organization. The members of each NESSG will be nominated by the respective operations office manager and approved by DP-20 prior to convening each review.

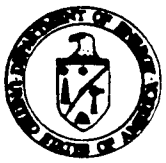
4. **Incentives for NESSG Participation**

   A program for recognition of NESSG members will be developed to include monetary compensation and career path incentives. Along with the addition of emeritus members, this should improve NESSG performance and elevate the stature of its members within both the DOE and respective sponsoring organizations.

5. **Retention of DOE Headquarters Approval for Nuclear Explosive Operations**

   Due to the serious consequences presented to national security and the public health and safety by an unintended nuclear explosive event, it is appropriate that final approval of the NESSG review reports be retained by DP-20.

Nuclear Explosive Safety Study Group (NESSG) Workshop



Panel Discussion

June 24, 1999

Agenda

9:00	Welcome	DASMASM
	Opening remarks	DNFSB, Other panel members
9:15	Intro DNFSB 98-2 Sub-Rec #5	Stan Puchalla
	DOE Implementation Plan actions	
	Current NES Study program	Stan Puchalla
9:45	AL perspective	Rick Glass
10:15	NV perspective	Travis Hunsaker
10:30	Break	
10:45	NES Study Group options	Stan Puchalla
	using DOE structures,	
	ACRS-like structures	
11:15	Panel discussion	Panel members
12:00	Adjourn	

NESSG Workshop Objectives

Understand the NESSG process and the issues identified in DNFSB 98-2.

Examine possible alternatives to the NESSG as suggested in sub-recommendation #5.

DNFSB 98-2 Sub-Rec 5

"Therefore, the Board recommends that:

...DOE establish a standing committee of NESS reviewers to replace the ad hoc groups now used; the membership of this body being centered on individuals of emeritus status with experience and proven stature in the nuclear weapons field. This body would be expected to conduct the safety reviews of the future."

Nuclear Safety and Nuclear Explosive Safety External Reviews (1986-1993)

- 1985 Blue Ribbon Panel on Nuclear Weapons Management (Judge Clark's Panel) - Questioned DOE nuclear safety program effectiveness.
- 1987 Advisory Committee on Nuclear Facility Safety (Ahearne Report) - Nuclear safety management and nuclear safety evaluations. Emphasized risk assessment and management techniques to enhance safety criteria, analysis and evaluation methods.
- 1988 Nuclear Weapons Safety Management Process Review (The Moe Committee)- recommended increased line management responsibility, accountability and emphasized DOE's role in DOD-DOE NWC safety and plutonium scatter matters.
- 1989 Drell Report - Enhance safety of deployed/fielded weapons systems. Addressed Plutonium Dispersal concerns in DOD and DOE. Recommended quantative risk assessments for weapons activities and operations.
- 1993 DNFSB Recommendations 93-1 Standards Utilization in Nuclear Explosive Operations.
- 1993 DNFSB request for independent review of the NESS process.

DOE-DNFSB Actions Concerning Nuclear Explosive Safety Since 1993

- **DNFSB Recommendation 93-1 Standards Utilization**
  - Increased formalization of the NES Program
  - Incorporated conventional nuclear safety guidance into safety program for nuclear explosive operations
- **NES Independent Review (1993-94)**
  - Commissioned by DNFSB to be independent of Defense Programs (DP)
  - Confirmed current 9 member NESSG program and process
  - Resulted in the NESS Corrective Action Plan requiring a formalized NES training program
- **Policy Changes (1995-1999)**
  - DP revised previous NES directives, developed NES standards and processes which were implemented program-wide

Current NESSG Membership

Nine Organizations Represented

AL	LANL	DP-21
NV	LLNL	MHC
OAK	SNL	AAO

All member organizations are specifically assigned the NESS function and are independent of line management responsibilities.

Training and Qualifications

All NESSG members must meet the requirements of DOE-STD-3015-97, NES Study Process

NESSG Activities

Independent review of the line management safety case.

The following technical areas are evaluated to assess the adequacy of positive measures (controls) to satisfy the three DOE nuclear explosive safety standards:

- Isolation from unwanted energy sources
- One-point detonation safety
- High-Explosive safety
- Design safety features
- Nuclear Explosive Safety Theme
- Electrical Tester design and safety
- Unique NES threats
- Material, tooling, mechanical and electrical equipment design, safety and use
- Adequacy of written procedures
- Human error threats
- Threats from security operations
- Transportation procedures and equipment
- Potential threats from associated equipment

SUMMARY OF DNFSB 98-2

Sub-Rec #5 (NESSG Membership)

- **NESSG Issues**
  - Erosion of numbers & experience of NESSG pool
  - Conflict of interest (Independence)
  - Lack of institutional memory
  - Lack of conformity & uniformity of standards & procedures
- **DNFSB Proposal**
  - Standing committee
  - Emeritus status
  - ACRS Model
- **Implementation Plan**
  - 5.5.1: Senior level workshop to review NESSG membership options; issue report; revise STD-3015-97
  - 5.5.2: Revise current T&Q standards process; certification process; revise STD-3015-97

ACRS-NESSG Comparison

NRC ACRS Membership	DOE NESSG Membership
1. Eleven Members. Chairman is selected by ACRS peers.	1. Nine Members, Chairman is selected by DOE/AL management.
2. Members drawn from external sources independent of the NRC.	2. Members drawn from the independent non-line, nuclear explosive safety organizations: DP-21, DOE/AL, DOE/NV, DOE/OAK, MHC, LANL, LLNL, and SNL.
3. Members are appointed for four year terms and normally serve no more than three terms.	3. Full-time permanent function. - Once certified, members have no time restriction on service - Members must be annually certified
4. Members are qualified by professional expertise in selected technical areas.	4. Members qualified by nuclear explosive experience and specific NES training and certification requirements of DOE- STD-3015.

ACRS-NESSG Comparison

ACRS Charter

Reviews and advises the NRC on licensing and operation of commercial nuclear facilities and related safety issues.

On its own initiative, may conduct reviews of specific safety-related items.

Upon DOE request, reviews and advises on hazards of DOE nuclear facilities (10CFR 1.13)

Advises DNFSB (PL 100-456)

ACRS Work Process

Expert-based review process.

Conducts (open) public meetings under the Federal Advisory Committee Act

Portions of meetings closed during review of Proprietary & National Security Information such as: Naval Reactors

Disseminates work product to the public.

NESSG Charter

Evaluates the NES aspects of proposed and existing DOE nuclear explosive operations and recommends to DP-20 final approval/ disapproval.

NESSG Work Process

Review process defined by DOE Order 452 Series.

Conducts classified meetings not open to the public due to National Security considerations.

Work product is restricted to DOE use.

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Erosion of Numbers/Experience*

"...The board is aware that the absence of design and testing of new nuclear weapons and the associated reduction in size of research and development staffs in the field are substantially reducing the numbers and experience of individuals available for membership in NESS groups."

* DNFSB 98-2, Sub Rec 5, Page 5

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Independence/Conflict of Interest*

"...The membership of the groups is now drawn from a relatively small pool of qualified persons. Many of these individuals are subject to conflict of interest since they are involved in actions and decisions that the groups they join are called to review."

* DNFSB98-2. Sub Rec 5, Page 5

Institutional Memory*

"...Moreover, few members of NESS groups have an institutional memory covering the safety process conducted in the past on the weapon system they are now reviewing."

"...On the other hand, individuals with institutional memory and with extensive history in the nuclear weapons field are still available, for instance, as retirees from the nuclear weapons program. The thought naturally arises that safety reviews might take advantage of the existence of this pool of expertise in a manner that also provides future continuity to the process."

* DNFSB 98-2, Sub Rec 5, Page 5

Continuity/Uniformity of Procedures*

"...Such a group would contain institutional memory important to safety, would avoid conflicts of interest that presently exist, and would provide continuity and uniformity of standards and procedures."

"...A standing NESS group of this kind might resemble in many features, the Nuclear Regulatory Commission's Advisory Committee on Reactor Safeguards (ACRS), which has provided guidance and continuity to safety of the commercial nuclear industry for half a century..."

* DNFSB 98-2. Sub Rec 5, Page 6

Framing the Issues
Erosion of Number & Experience

- DOE acknowledges the diminishing opportunity for the types of experience that produce NESSG candidates
- Current status:
  - The NESSG uses national laboratory subject matter expert and other outside experts to augment and provide advice on specific technical issues
  - NESSG training and certification programs are improving
  - Mentoring and archiving programs
- Potential additional steps:
  - Expand Technical Advisor Corps (TAC) base to include more disciplines and training
  - Increase internal recruiting (incentives for NESSG service)

Framing the Issues
Independence/Conflict of Interest

- DOE recognizes the challenge to have NESSG remain objective and retain independence of actions
- Current status:
  - All NESSG members are assigned to independent non-line organizations
  - What level of organizational independence is acceptable?
- Potential Additional Steps:
  - Further split the organizational tie within DOE
  - External options (ACRS, etc.)

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Framing the Issues
Institutional Memory

- DOE acknowledges few NESSG members have institutional memory covering nuclear explosive operations from earlier decades
  - Is this a major problem, as past processes were different?
  - Is current NES state-of-the-art emphasis more important?
- Current status:
  - TAC provide current and historical knowledge augmentation
  - Archival efforts provide a process for accessing historical data
  - Today's Pantex operations and processes are different from those of the past.
- Potential Additional Steps:
  - Augment the NESSG with individuals possessing institutional memory/emeritus status
  - Further enhance existing training and qualification programs by increasing awareness of historical data and lessons learned

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Framing the Issues
Continuity/Uniformity of Procedures

- DOE acknowledges that many changes have occurred to the Pantex safety management process over the last several years
- Current status:
  - The NESSG has provided a consistent safety back stop
  - The rigor and formality of the NESS Process have improved (DOE-STD-3015)
  - Acceptability of input documentation is being tightened
  - Increased line management role in designing NES into nuclear explosive operations

NESSG Options

- **DOE NESSG Options ***
  - NESSG-1: 5 member (AL, DP-21, LANL, LLNL, SNL)
  - NESSG-2: 7 member (NESSG-1 + AAO + MHC)
  - NESSG-3: 9 member (NESSG-2 + NV + OAK)
- **Standing Committee (ACRS model)**
  - NESSC-1: Replaces NESSG
  - NESSC-2: NESSG+Emeritus Group *
  - NESSC-3: Pilot of NESSC-1

* All options include a Technical Advisor Corps (TAC)

Framing the Options

	NESSG-1 *LANL, LLNL, SNL; AL, DP-20* *(Minimum capability)*	*NESSG-2* *LANL, LLNL, SNL; AL, DP-20; MHC, AAO* *(Enhance capabilities)*	*NESSG-3: LANL, LLNL, SNL; AL, DP-20, AAO, MHC, NV, OAK* *(Current Structure)*
Erosion of numbers/ experience	Emphasizes design experience. Limited production and/or plant perspectives	Increases manufacturing, production understanding and emphasis. Enhanced on-site knowledge	Supports the retention of expertise for NES and NTS related activities. Diversity enhanced Highest level of weapons experience
Conflict of Interest/ Independence	Independent of both production and line management organizations	AAO and MHC members are functionally independent of the work, but organizationally, could be considered as lacking sufficient independence from site management.	NV & OAK provide functional and organizational independence.
Institutional Memory	Potential access to original design team and design data not available elsewhere Limited production expertise	Add AAO and MHC practical (hands-on) experience perspective. Increased access to on-site information for desired depth or background.	Adds supplemental R&D/Testing perspectives and knowledge base.
Continuity/Uniformity of Procedures Standards	-Well established and documented process - Qualitative/expert based evaluation with some standard-based input		

	Framing the Options *NESSC #1 (Totally replace the NESSG)*
Erosion of Numbers/ Experience	Population base for recruitment needs to be evaluated Currency and relevance of work experience needs to be assessed Expert-level nuclear explosive safety personnel may require introduction to NES-unique issues and attributes
Conflict of Interest/ Independence	Solved by definition Prior experience for direct/indirect review or oversight needs to be evaluated May be subjected to fiscal or legal limitations concerning independent boards and committees
Institutional Memory	Unique proficiency/training or orientation may be required to achieve desired NES expertise/ knowledge May have to depend on external/additional technical support staff to act as institutional memory
Continuity/ Uniformity of Procedures Standards	Standards based evaluations require extensive testing and database, not currently available Administrative support required to standardize NES information for evaluations/final reports Timeliness and responsiveness may require additional dedicated administrative and support staff

	Framing the Options *NESSC-#2* ***(Current NESSG with Emeritus augmentation)***
Erosion of Numbers/ Experience: (Fewer NESSG members with weapon design experience)	Depth and breadth may be strengthened over current process Allows real time mentoring of NES personnel by emeritus members
Conflict of Interest/ Independence	Management must plan assignments to avoid potential future conflicts of interest Builds strengths of existing NESSG organizational capabilities and expertise
Institutional Memory	Institutional memory enhanced by using emeritus augmentation Promotes real time mentoring, interaction and exchange between NESSG and emeritus personnel on safety expertise, ideas and concepts
Continuity/ Uniformity of Procedures Standards (Consistency from NESS-to-NESS)	Similar to current NESSG technical advisor usage Consistency improved by feedback on qualitative expert-based process NESSC supported by existing HQ and field NES personnel

	Modified NESSG Options			NESSC Options (Standing Committee)	
	NESSG-1 (5)	*NESSG-2 (7)*	*NESSG-3 (9)*	*NESSC-1 (NEW)*	*NESSC-2 (NESSG +TAC)*
Erosion of Numbers/ Experience					
Conflict of Interest					
Institutional Memory					
Continuity/ Uniformity of Procedures/ Standards					

Backup slides follow

NESSG Participation

(1996- 1999)

- Federal
  - HQ 4
  - OAK 4
  - AAO 3
  - AL 5
  - NV 3
- National Laboratories
  - SNL 4
  - LLNL 3
  - LANL 5
- Support Contractors
  - MHC 3
  - Others 5
- Technical Advisors: HE, Risk Assessment, Tooling, Chemical, Electrical, etc
  - W69 (5)
  - W79 (6)
  - Electrical MS (2)
  - Security MS (2)

NESSG MEMBERSHIP (1996-1999)

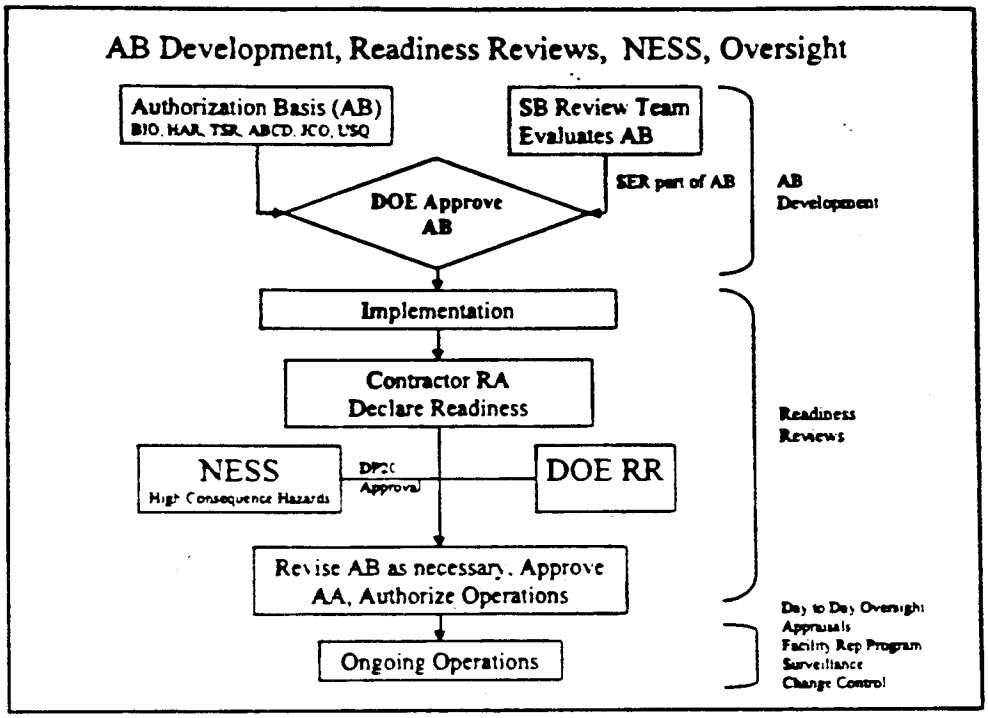
NESS	Completion Date	LANL	LLNL	SNL	Pantex	OAK	AAO	NV	AL	HQ
W76 NESS Revalidation	2/1/96	Simonsic	Devlin	Lewis	Keith	Plencner	Kellogg	Owens	Rider	Stepan
SGT Over-The Road Add	2/16/96	Simonsic	Devlin	Cates	Galloway	Duarte	Kellogg	Luette	Thompson	Stepan Morrison
B61-3/4/10 Revalidation	3/19/96	Simonsic	Devlin	Mauldi	Keith	Kontaxis	Thompson	Luette	Pecsok	Weidman
W70 "Cracker"	9/5/96	Sinonsic	Devlin	Cates	Keith	Kontaxis	Kellogg	Owens	Rider	Weidman
NV DAF AS&T MS	9/10/96	Kelly	Devlin	Konnick	Keith	Lovell	Kellogg	Owens	Nichols	Weidman
B83 Revalidation	9/20/96	Simonsic	Devlin	Lewis	Keith	Duarte	Thompson	Owens	Pecsok	Stepan
W87 Revalidation	1/16/97	Morris	Winstanley	Cates	Rinella	Duarte	Thompson	Luette	Pecsok	Morrison
W80 Revalidation	2/20/97	Morris	Devlin	Lewis	Rinella	n/a	Thompson	Hunsaker	Pecsok	Weidman
W69 NESS	6/5/97	Simonsic	McGee	Mauldin	Keith	Lovell	Kellogg	Owens	Rider	Morrison
Pantex Security NES MS	9/26/97	Stepan	Winstanley	Mauldin	Keith	Wilhelm	Thompson	Hanson	Rider	Morrison
PT4172 and PT4030 for use with B83 NES Evaluation	12/18/97	Simonsic	Devlin	Mauldin	Keith	Plencner	Kellogg	Behne	Pecsok	Weidman
W79 NESS	4/9/98	Simonsic	Devlin	Mauldin	Keith	Behne	Thompson	Owens	Rider	Morrison
B61-11 NES Evaluation	4/24/98	Stepan	Winstanley	Lewis	Rinella	Wilhelm	Kellogg	Hanson	Pecsok	Weidman
Electrical Equip Control NES Master Study	9/11/98	Stepan	Winstanley	Cates	Keith	Wilhelm	Kellogg	Owens	Rider	Hagan
PT4174 for use with W87 NESS	12/10/98	Stretz	Winstanley	Mauldin	Galloway	Plencner	Young	Hanson	Sherry	Morrison
W56 NESS	12/11/98	Stepan	Devlin	Cates	Keith	Wilhelm	Thompson	Behne	Pecsok	Weidman
PT4174 for use with W62 and W88 NESS	4/13/99	Simonsic	Devlin	Mauldin	Galloway	Wilhelm	Kellogg	Hanson	Sherry	Morrison

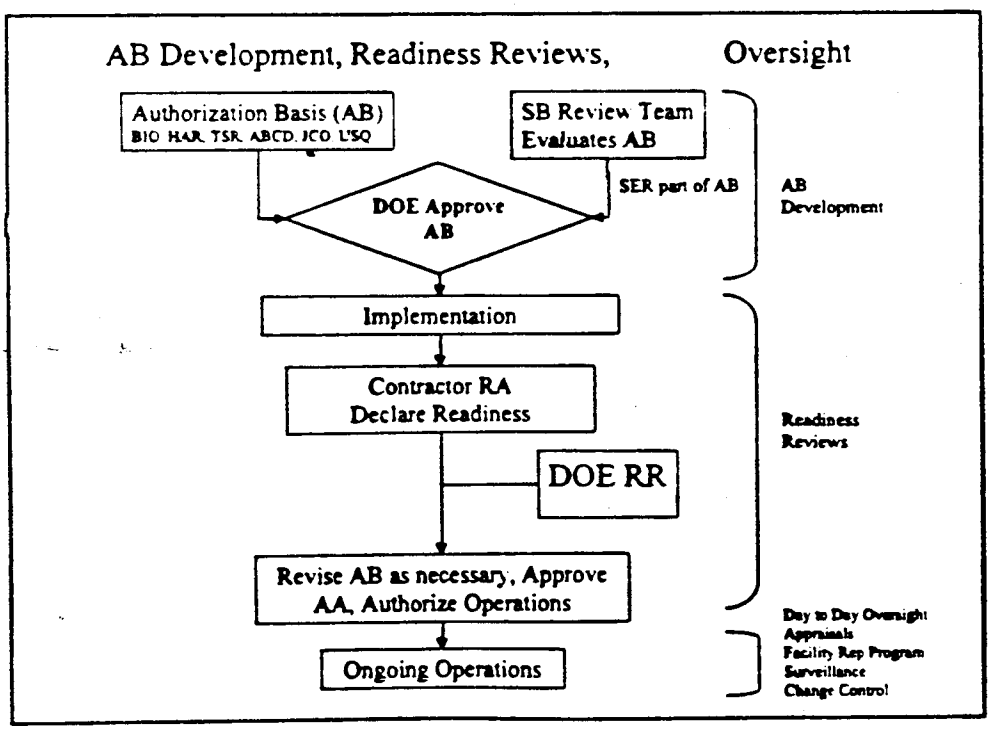
Presentation

Mr. Richard Glass,

Manager, Albuquerque Operations Office

Pantex Authorization Basis Development, Readiness, NESS Oversight


AB Development, Readiness Reviews, NESS, Oversight
Authorization Basis (AB)
BIO, HAR, TSR, ABCD, ICO, USQ
SB Review Team Evaluates AB
SER part of AB
DOE Approve AB
AB Development
Implementation
Contractor RA Declare Readiness
NESS
High Consequence Hazards
DOE RR
Approval
Readiness Reviews
Revise AB as necessary, Approve AA, Authorize Operations
Ongoing Operations
Day to Day Oversight
Appraisals
Facility Rep Program
Surveillance
Change Control


AB Development, Readiness Reviews, Oversight
Authorization Basis (AB)
BIO HAR TSR ABCD ICO USQ
SB Review Team Evaluates AB
SER part of AB
DOE Approve AB
AB Development
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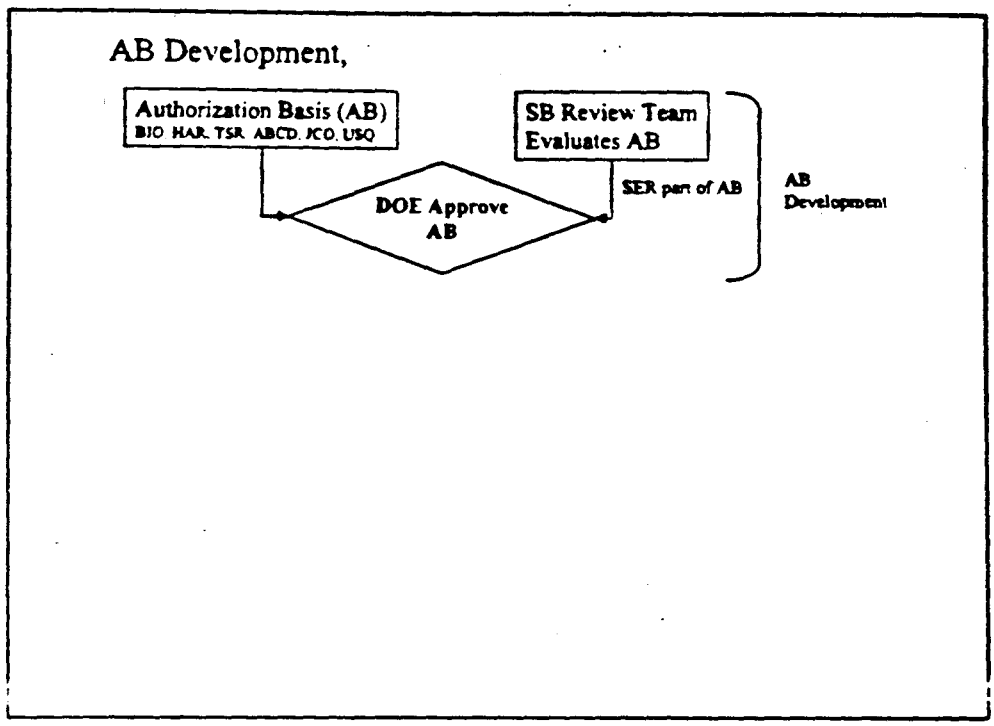
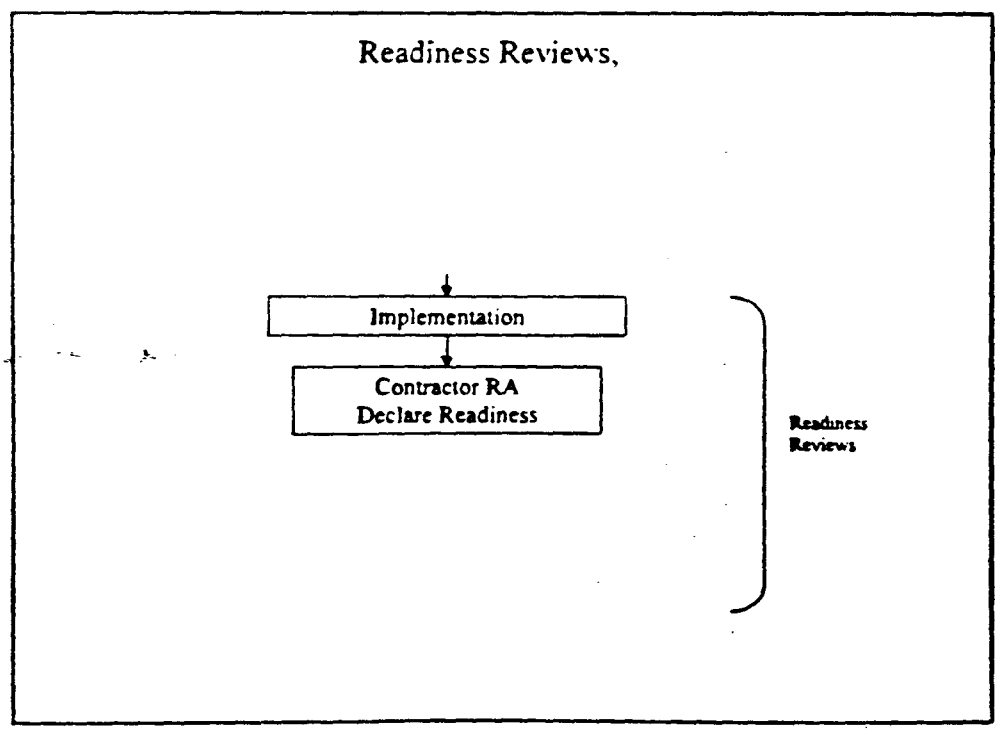
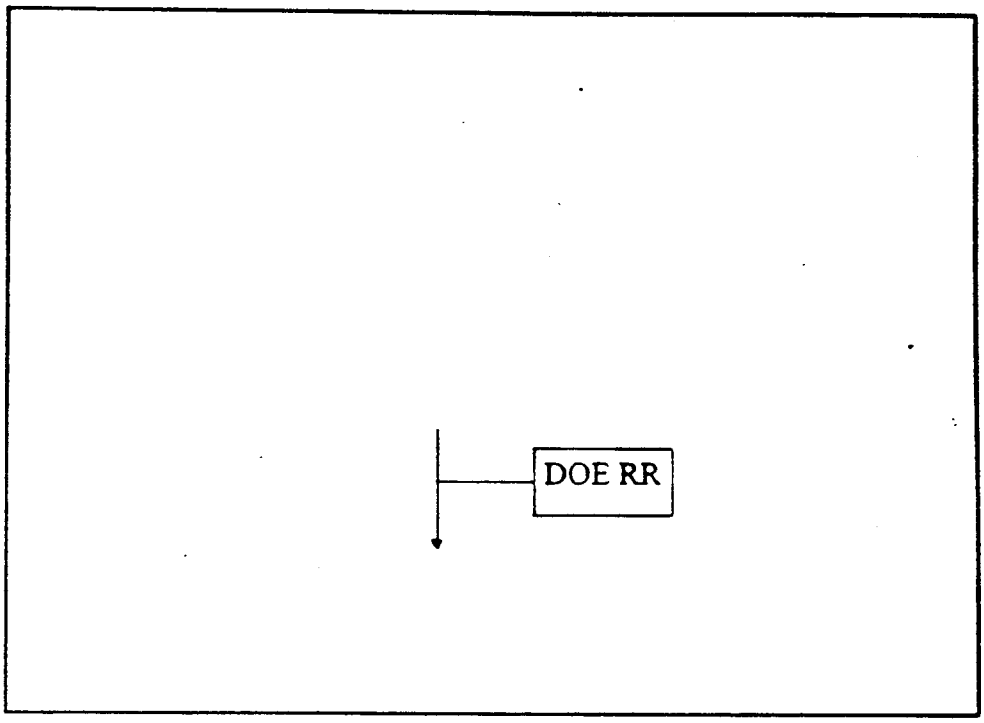
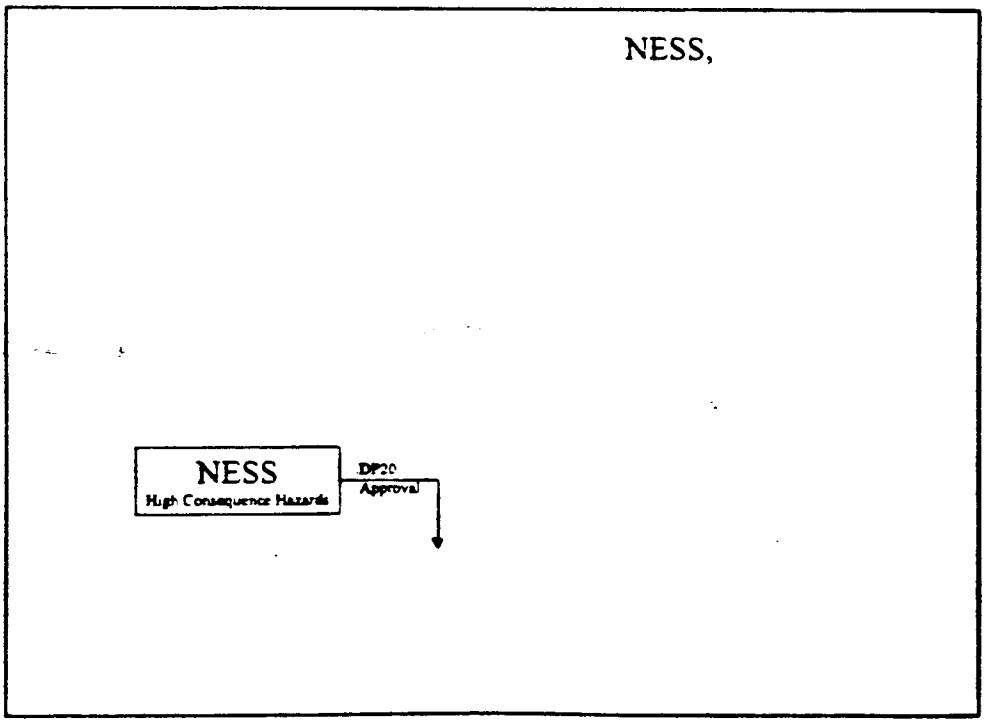

AB Development,
Authorization Basis (AB)
BIO, HAR, TSR, ABCD, ICO, USQ
SB Review Team
Evaluates AB
DOE Approve
AB
SER part of AB
AB
Development


Readiness Reviews,
Implementation
Contractor RA
Declare Readiness
Readiness
Reviews


DOE RR


NESS,
NESS
High Consequence Hazards
DP20
Approval

Revise AB as necessary, Approve AA. Authorize Operations

Oversight

Ongoing Operations

- Day to Day Oversight
- Appraisals
- Facility Rep Program
- Surveillance
- Change Control

Assumptions

- Pantex Authorization Basis is equivalent to nuclear facility operations, without the NESS.
- AB implementation and operational oversight must provide adequate confidence to authorize operations, without the NESS
- Due to potential consequences of NEO, an additional independent review, NESS, is appropriate to increase confidence beyond adequate.
- NESS must perform a unique role not already performed adequately by other system elements

Nuclear Facility Model

- Contractor develops Authorization Basis
- DOE approves & contractor implements AB
- Contractor performs RR & declares readiness
- DOE performs independent RR
- DOE authorizes operations

NES Standards

To prevent nuclear detonation and Pu dispersal from the pit, there shall be positive measures to:

- minimize the possibility of accidents , inadvertent acts, or authorized activities that could lead to fire, HED/D.
- minimize the possibility of fire, HED/D given accidents, inadvertent acts.
- minimize the possibility of DUA that could lead to HED/D

NES Study Group Workshop

NV Perspective

June 24, 1999

NES Study Group Workshop

- **Proposed Membership for NESSG**
  - **Continue Current NESSG Membership**
    - **Gerry Johnson "Removing NV from the NESSG membership ignores the responsibility for NV to maintain test readiness and our tasking to handle a damaged nuclear weapon including either disposal or dismantlement options".**

NES Study Group Workshop

- **NV Required to Maintain a Level of Expertise to Meet Commitment to Readiness to Resume Testing.**
- **Perform an NES review for any Damaged Nuclear Weapon brought to the NTS.**

NES Study Group Workshop

- Benefits to DOE
  - **Maintains NESSG Member Independence**
  - **NESSG Members have a vested interest in the outcome**
  - **Present members have knowledge of NES**
  - **Current process produced excellent track record**

NES Study Group Workshop

- **Benefits to DOE/NV**
  - **Maintain Test Readiness without added cost of NTS exercises**
  - **Maintain capability to dispose of DNW**
  - **Provide a measure of independence.**