

SUMMARY OF NRC-DOE TECHNICAL EXCHANGE
ON DOE'S ESF ALTERNATIVES STUDY
April 7, 1990
Las Vegas, Nevada

Agenda: See Attachment 1.

List of Attendees: See Attachment 2.

Summary:

On April 7, 1990, the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE) conducted a technical exchange on the status of DOE's Exploratory Shaft Facility (ESF) Alternatives Study. The purpose of the exchange was for DOE to explain how 10 CFR Part 60 requirements are being considered in the ongoing study to evaluate alternative repository access configurations and ESF configurations and construction methods. DOE gave a presentation illustrating how 10 CFR Part 60 requirements are being used in three different places in the study (Attachment 3) and in particular, how those requirements have been used in the preliminary screening of ESF/repository options (Attachment 4). The State of Nevada was a participant in this exchange.

DOE indicated that its incorporation of 10 CFR Part 60 requirements into the ESF Alternatives Study was in part a response to one of NRC's major Site Characterization Analysis (SCA) concerns, namely, that the ESF design in DOE's Site Characterization Plan (SCP) for the Yucca Mountain site did not consider all the applicable 10 CFR Part 60 requirements. NRC considered the discussion beneficial in clarifying DOE's current approach to address that concern. NRC's questions focused primarily on how preservation of the site's waste isolation capability is being explicitly factored into the process leading to eventual selection of a preferred ESF/repository option.

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AGENDA

DOE-NRC TECHNICAL EXCHANGE ON THE ESF ALTERNATIVES STUDY
FLAMINGO HILTON HOTEL, LAS VEGAS, NV
APRIL 7, 1990

1:30 PM to 3:00 PM

PURPOSE: To provide the NRC with information on the consideration of 10 CFR Part 60 requirements in the study being performed to evaluate alternative repository access configurations and ESF configurations and construction methods.

<u>Agenda Topics</u>	<u>Discussion Leader</u>
o Opening remarks	DOE, NRC, State
o Introduction	DOE
o Consideration of 10 CFR Part 60 requirements	DOE
Discussion	All
o Closing remarks	DOE, NRC, State

417

DOE/NRC Tech. EAC
ESF Alternatives

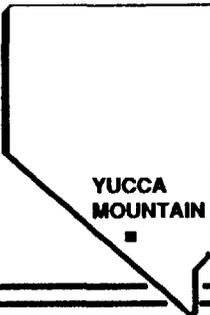
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U.S. DEPARTMENT OF ENERGY

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YUCCA MOUNTAIN PROJECT

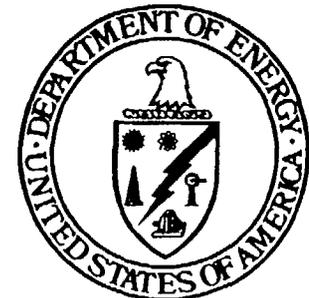
**DOE-NRC TECHNICAL EXCHANGE ON
THE ESF ALTERNATIVES STUDY**

CONSIDERATION OF 10 CFR 60 REQUIREMENTS

PRESENTED BY

LEO LITTLE

**DIRECTOR, ENGINEERING AND DEVELOPMENT DIVISION
YUCCA MOUNTAIN PROJECT**



APRIL 7, 1990

ACTIVITIES LEADING TO THE NEED FOR AN ESF ALTERNATIVES STUDY

- **DOE RECEIVED COMMENTS ON THE SCP FROM NRC AND OTHER PARTIES EXTERNAL TO DOE IN 1989**
- **NWTRB STRUCTURAL GEOLOGY AND GEOENGINEERING PANEL OFFERED SUGGESTIONS ON ESF CONSTRUCTION AND TESTING**
- **DOE EVALUATED THE NWTRB SUGGESTIONS DURING THE SUMMER OF 1989**
- **NWTRB PROVIDED ADDITIONAL ESF SUGGESTIONS IN AUGUST 1989**
- **DOE/HQ ISSUED GUIDANCE, BASED ON THE ABOVE CONCERNS, TO YMPO FOR IMPLEMENTING A STUDY FOR EVALUATION OF ALTERNATIVES UNDER A 10 CFR 60 SUBPART G PROGRAM**

IMPLEMENTATION PLAN

IMPLEMENTATION OF THE DOE/HQ GUIDANCE IS BEING CARRIED OUT BY YMPO AS FOLLOWS:

- **YMPO IS DIRECTING THE WORK THROUGH THE PROJECT OFFICE ENGINEERING AND DEVELOPMENT DIVISION**
- **SNL HAS BEEN ASSIGNED THE LEAD TECHNICAL AND COORDINATION RESPONSIBILITIES**
- **PROJECT PARTICIPANTS ARE PROVIDING MATRIX SUPPORT TO EACH TASK AS REQUIRED**

OBJECTIVES OF THE STUDY:

- **TO RESOLVE NRC OBJECTIONS AND CONCERNS**
- **TO ADDRESS NWTRB RECOMMENDATIONS**
- **TO RESOLVE CONCERNS OF THE STATE OF NEVADA AND LOCAL AGENCIES**

NRC CONCERNS

- **ONE OF THE MAJOR NRC CONCERNS IS THAT THE ESF DESIGN DOES NOT CONSIDER ALL APPLICABLE 10 CFR 60 REQUIREMENTS**

ESF ALTERNATIVES STUDY

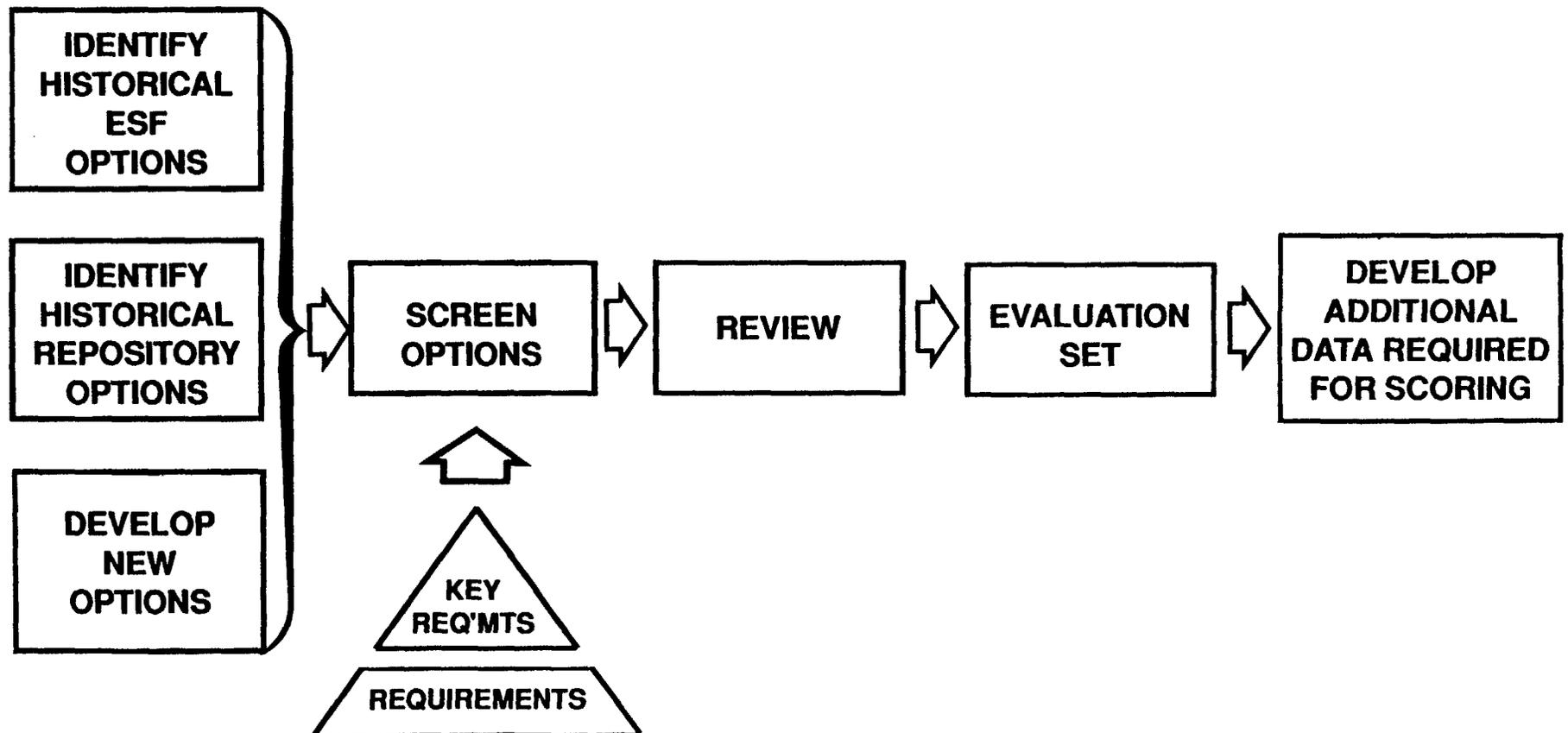
● SPECIFIC DUTIES OF TASK GROUP 3

- REVIEW ALL EXISTING PROGRAM REQUIREMENTS DOCUMENTS**
- IDENTIFY THOSE REQUIREMENTS WHICH MAY IMPACT THE SELECTION OF THE PREFERRED REPOSITORY ACCESS CONFIGURATION AND THE ESF CONFIGURATION AND CONSTRUCTION METHOD**

10 CFR 60 REQUIREMENTS ARE USED IN THREE PLACES IN THE ALTERNATIVES STUDY

- 1. PRELIMINARY SCREENING OF OPTIONS**
- 2. BASIS FOR OPTION EVALUATION (THROUGH
INFLUENCE DIAGRAMS)**
- 3. DESIGN REQUIREMENTS DOCUMENTS**

DEVELOP ESF/REPOSITORY OPTIONS

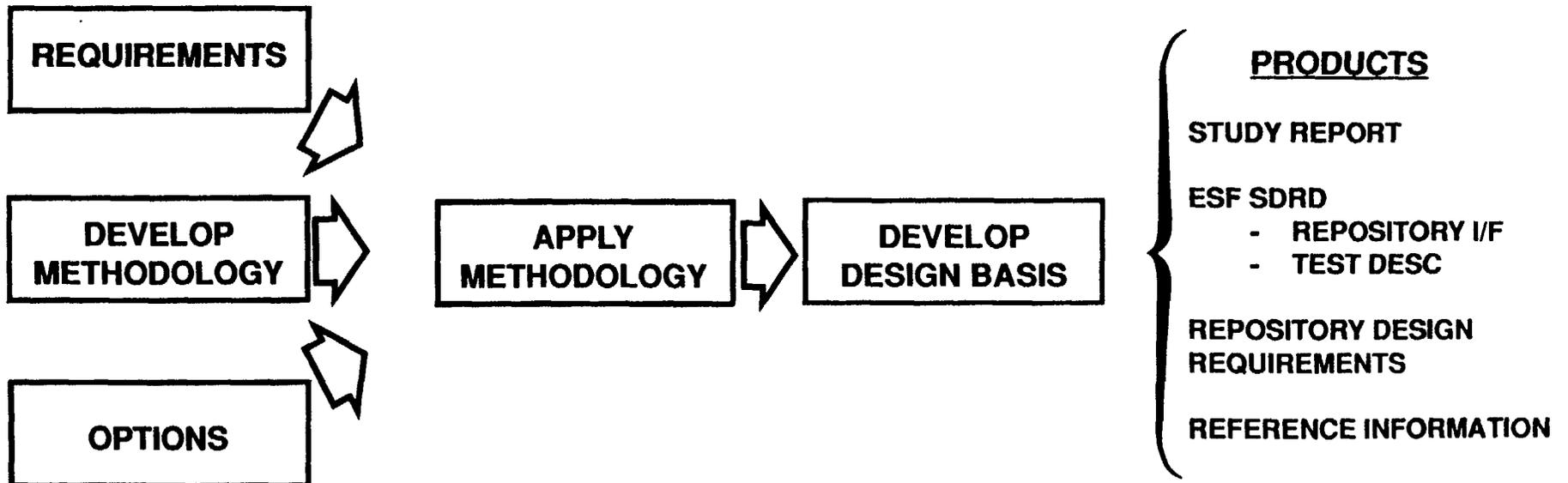


1. PRELIMINARY SCREENING OF OPTIONS

- **5 OF THE 6 SCREENING REQUIREMENTS WERE DERIVED FROM 10 CFR 60**
- **52 ESF/REPOSITORY OPTIONS WERE SCREENED DOWN TO 31 OPTIONS, AS THE PRELIMINARY STEP IN DEVELOPING THE SET OF OPTIONS FOR EVALUATION**

NOTE: THE ESF/REPOSITORY OPTIONS WILL BE SUBSEQUENTLY EVALUATED USING ALL REQUIREMENTS, THROUGH THE INFLUENCE DIAGRAMS/OBJECTIVES

ESF ALTERNATIVES STUDY



PRODUCT OF REQUIREMENTS TASK

**IDENTIFICATION OF REQUIREMENTS
TO BE RELATED TO (CROSSWALKED
WITH) THE OBJECTIVES THROUGH THE
INFLUENCE DIAGRAMS**

2. BASIS FOR EVALUATION OF OPTIONS

- **THE METHODOLOGY INCORPORATED REQUIREMENTS THROUGH THE INFLUENCE DIAGRAMS VIA SPECIFIC CATEGORIES (i.e., POSTCLOSURE PERFORMANCE, TESTING, RADIOLOGICAL SAFETY, etc.)**
- **REQUIREMENTS WERE CATEGORIZED ACCORDING TO INFLUENCE DIAGRAM CATEGORIES (SEE MATRIX)**
- **REQUIREMENTS WERE CLASSIFIED FOR IMPACT ON DISCRIMINATING BETWEEN OPTIONS**

CLASSIFICATION OF REQUIREMENTS

DISCRIMINATION CLASS

IMPACT OF REQUIREMENT IN DISCRIMINATION BETWEEN OPTIONS

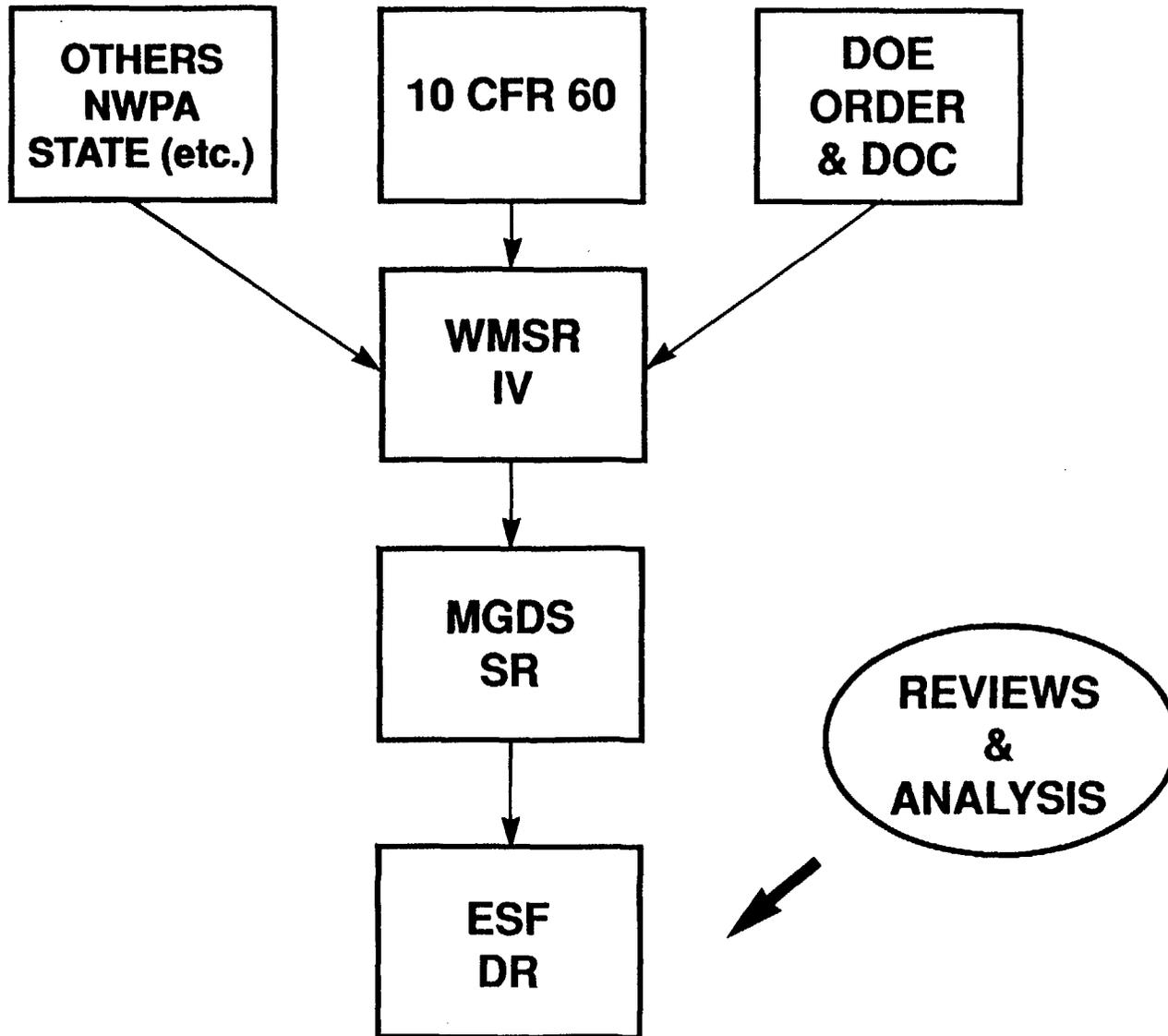
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|---|--|
| 1 | VALUE OF THE PERFORMANCE MEASURE (PM) FOR AN OPTION IS EXPECTED TO DEPEND STRONGLY ON THIS REQUIREMENT |
| 2 | VALUE OF THE PM FOR AN OPTION IS NOT EXPECTED TO DEPEND STRONGLY ON THIS REQUIREMENT |
| 3 | REQUIREMENT NOT EXPECTED TO DISCRIMINATE BETWEEN OPTIONS |

NOTE: ALL REQUIREMENTS WILL BE INCLUDED IN DESIGN BASES FOR THE PREFERRED OPTION

3. DESIGN REQUIREMENTS DOCUMENTS

- **REQUIREMENTS DOCUMENT HIERARCHY IS BEING DEVELOPED AS A BASIS FOR DESIGN**
- **ESF DESIGN REQUIREMENTS DOCUMENT WILL BE REVISED TO INCORPORATE RESULTS OF THIS STUDY**
- **THE REPOSITORY DESIGN REQUIREMENTS WILL BE REVISED TO INCORPORATE INTERFACE REQUIREMENTS WITHIN THE ESF**
- **ALL REVISIONS WILL BE PROCESSED IN ACCORDANCE WITH QA PROCEDURES**

REQUIREMENTS FLOWDOWN





YUCCA MOUNTAIN PROJECT

ESF ALTERNATIVES STUDY

INITIAL REGULATORY AND FUNCTIONAL REQUIREMENTS SCREENING

Option Identifier _____

Statement of Requirement	Sources		Evaluation of Compliance
	Document	Section	

Requirement 1

The design of the underground facility, including the shaft collar area, ramp portals, and main pads should provide for control of water or gas intrusion. The shaft collars and ramp portals should be located to prevent water inflow from a probable maximum flood (PMF).	10 CFR 60	60.133(d)	
	DAA	1.12.1.1	
	DAA	2.3.4.1	
	SDRD	1.2.6.1 PC3c	
	SDRD	1.2.6.1.1 PC1b	
	SDRD	1.2.6.1.4 PC2	

Requirement 2

The ESF underground excavation shall be of adequate size to support current and future testing. The underground excavation shall be able to accommodate site specific conditions and be able to drift from the MTL up to 10,000 ft to other parts of the repository block.	10 CFR 60	60.74(a)	
	10 CFR 60	60.133(b)	
	DAA	2.4.6.5	
	SDRD	1.2.6.5	
			Constraint O.v.

Requirement 3

Two means of access (egress) shall be incorporated into the ESF.	30 CFR 57	57.11050	
	SDRD	1.2.60	Performance Criterion 4c


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ESF ALTERNATIVES STUDY
**INITIAL REGULATORY AND FUNCTIONAL
REQUIREMENTS SCREENING
(CONTINUED)**

Statement of Requirement	Sources		Evaluation of Compliance
	Document	Section	
Requirement 4			
The openings required for rock handling and for support facilities (e.g., maintenance shops, electrical substations, pump stations, refuge chambers, lunch rooms, and storage facilities) shall be located away from in situ site characterization testing.	10 CFR 60 SDRD	60.133(b) 1.2.6.6.1 PC1a	
Requirement 5			
Long exploratory drifts extended laterally from the ESF on the MTL shall be constructed in locations that will permit them to be used to support repository operations.	10 CFR 60 SDRD	60.15(c)(4) 1.2.6.6 Con E.Iv	
Requirement 6			
The ESF shall be designed with a minimum of 75 feet between the centerlines of adjacent ESF and waste emplacement drifts.	10 CFR 60 DAA	60.130 1.10.6.1	

Evaluation of compliance will be either:

YES - the option being evaluated complies with the requirement;

NO - the option being considered does not comply with the requirement; or

UNCERTAIN - it cannot be determined whether the option complies with the requirement.

A NO evaluation must be explained in the comments section below and will result in the option being eliminated from further consideration.