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7. Abstract This document provides technical interpretations of DOE 5480.7A fire protection objectives and DOE 6430.1A criteria. The technical basis for the fire hazards analysis, the design basis fire, the maximum possible fire loss, the maximum credible fire loss, fire protection requirements, and discussion of various methods used to satisfy the FHA and SAR order requirements and provide consistency between the analyses are also addressed.		
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**INTEGRATION OF
FIRE HAZARDS ANALYSIS
AND
SAFETY ANALYSIS REPORT
REQUIREMENTS**

September 9, 1994

**Westinghouse Hanford Company
Richland, Washington**

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**INTEGRATION OF
FIRE HAZARDS ANALYSIS
AND
SAFETY ANALYSIS REPORT
REQUIREMENTS**

1.0 PURPOSE

The purpose of this document is to establish the fire protection policy for Westinghouse Hanford Company (WHC) relative to U.S. Department of Energy (DOE) and DOE Richland Operations Office (RL) directives for Fire Hazards Analyses (FHAs). The policy also establishes the relationship of FHAs to facility Safety Analysis Reports (SARs).

2.0 POLICY OBJECTIVE

The objective of this policy is to describe the function of the FHA and its relationship to the SAR for a particular facility such that:

- The FHA develops one or more bounding fire events which are evaluated to assess the adequacy of the facility design in meeting the objectives of DOE 5480.7A.
- The onsite/offsite and public safety objectives of DOE 5480.7A are assessed through the SAR accident analysis, using the uncontrolled fire event(s) developed by the FHA as a basis.
- The life safety, programmatic, and fire loss objectives are assessed in the FHA.
- The SAR references the FHA as its fire event source document. The FHA in turn references the SAR analysis and verifies that the health and safety objectives of DOE 5480.7A are adequately met.
- Deviations from established fire protection design criteria of DOE 6430.1A and DOE 5480.7A shall be justified by the FHA.

To accomplish the policy objective, it is necessary to provide technical interpretations of the DOE 5480.7A Order objectives, as well as the definition, purpose, regulatory basis, and methods of performance for each of several related terms used in DOE 5480.7A and DOE 6430.1A.

3.0 DOE 5480.7A OBJECTIVES

The objectives of DOE 5480.7A (reference 1) are established in Section 4 of the Order and listed below. To accomplish these objectives, DOE embraces a "defense-in-depth" approach based on industry codes and standards imposed on conservative design criteria and supplemented by a comprehensive fire protection program.

The design and program criteria of DOE 5480.7A, DOE 6430.1A (reference 2), RLID 5480.7 (reference 3), and DOE 5480.4 (reference 4) are implemented by WHC-CM-4-41 (reference 5) and applied in concert to meet these objectives. If an applicable design or program feature is absent, one or more of these objectives may be compromised. These design and program criteria shall be applied during the siting, design, operation, maintenance, modification, decommissioning, and demolition of a facility.

The objectives b. and c. of DOE 5480.7A are assessed using the facility SAR to assess the health and safety risks of fire and explosion against the established risk acceptance criteria of WHC-CM-4-46 (reference 6).

The objectives are listed here as stated in the Order, along with the methodology used to achieve them (stated below each objective):

a. *Minimize the potential for the occurrence of a fire.*

The objective is achieved through integration of the design and program criteria of DOE 6430.1A and DOE 5480.7A using the prescribed fire protection codes and standards of DOE 5480.4. The Fire Hazards Analysis (FHA) shall verify that this objective is met and can be maintained over time.

b. *Ensure that fire does not cause an on-site or off-site release of radiological and other hazardous material that will threaten the public health and safety or the environment.*

The SAR analyzes the health and safety consequences of the design basis fire (DBF) in its accident analysis section, ensuring that it is consistent with the fire event(s) developed by the FHA. The SAR references the FHA and identifies safety classifications and administrative controls for those structures, systems, and components (SSCs) whose function is to 1) mitigate the fire event, and 2) operate throughout the fire event, using the WHC safety classification system. The FHA shall reference the SAR when the health and safety consequences are determined and compared against acceptance criteria to verify that this objective is met.

c. *Establish requirements that will provide an acceptable degree of life safety to DOE and contractor personnel and [ensure] that there are no undue hazards to the public from fire and its effects in DOE facilities.*

WHC-CM-4-41 *Fire Protection Program Manual* implements the DOE and RL fire protection requirements, which include NFPA 101, *Life Safety Code* (reference 7), and standards of the *DOE Fire Protection Resource Manual* (reference 8). The requirements to mitigate hazards to the public are

established through the methodology of achieving objective b. above. The FHA shall verify that this objective is met.

- d. *Ensure that process control and safety systems are not damaged by fire or related perils.*

Process control and safety systems, especially those designed to mitigate the effects of a design basis accident or ensure safe shutdown of a facility, shall be protected to the extent that established health and safety limits, program interruption, and fire loss criteria are not exceeded. The FHA shall verify that this objective is met.

- e. *Ensure that vital DOE programs will not suffer unacceptable delays as a result of fire and its effects.*

Program interruption is based on that resulting from the most serious fire(s) developed by the FHA when mitigated by the installed automatic fire suppression system. The acceptable program delay as identified by the Program Secretarial Officer (PSO) may require an upgraded automatic fire suppression system. The PSO also determines other DOE programs to which these limits apply. The FHA shall verify that this objective is met.

- f. *Ensure that property damage from fire and related perils does not exceed an acceptable level.*

An analysis of the most serious fire(s) developed by the FHA is performed to determine the maximum possible fire loss (MPFL) for each fire area or over several fire areas in accordance with the MPFL criteria below. The FHA shall verify that adequate mitigating features are provided when required by mandated loss limitations.

4.0 FIRE HAZARDS ANALYSIS

4.1 DEFINITION

The FHA is a comprehensive assessment of the risk from fire in a given facility or fire area. It analyzes the relationship of existing or proposed facility/area fire protection design and facility occupancy against established safety and loss limitation criteria.

4.2 PURPOSE

The purpose of the FHA is to comprehensively assess the risk from fire within individual fire areas of DOE facilities in relation to existing or proposed fire protection features so as to ascertain whether the objectives of DOE 5480.7A are met.

4.3 REGULATORY BASIS

- A. DOE 6430.1A, Section 0110-6.2, "Fire Protection Design Analysis" requirements include:
- 1) "A special fire protection design analysis shall be made of each facility vital to DOE mission accomplishment...
 - 2) "A general fire protection design analysis shall be made of each facility...
 - 3) "The analysis shall be documented in report form in the facility project files and referenced by the SAR...
 - 4) "Fire-protection design analysis shall be done as soon as possible and included as a portion of the Title I Design Summary document required by DOE 4700.1."

These requirements are met by the preliminary FHA.

- B. DOE 6430.1A, Section 0111-99.0.1, "Special Facilities - General Requirements," requires a "fire risk analysis." This requirement is met by the FHA.
- C. DOE 6430.1A, Section 1530-99.0, "Fire Protection - Nonreactor Nuclear Facilities," requires an "assessment shall be made early in design or modification to determine the facility structures, systems, and components that shall be protected against the effects of a DBF and explosion..." This requirement is met by the preliminary FHA and associated safety analysis documentation.
- D. DOE 5480.7A identifies the criteria for a graded FHA and provides that existing nuclear facilities, as well as new facilities, shall have a FHA. The PSO determines other facilities for which a FHA is required.
- E. RLID 5480.7.

- F. WHC-CM-4-41, Section 3.4, "Fire Hazards Analysis Requirements."
- G. DOE memorandum EH-31.3 (reference 9) provides general guidance for the performance of a FHA. Completion of the preliminary FHA as part of the Title I Design Summary meets the DOE 6430.1A requirement for a fire protection design analysis.

4.4 METHODS OF PERFORMANCE

- A. For new facilities and upgrades/modifications, it is the responsibility of the project manager to ensure that the FHA is completed in accordance with the established guidelines of WHC-CM-4-41, Section 3.4. For existing facilities, it is the responsibility of the facility manager to ensure a FHA is completed in accordance with their implementation plan for DOE 5480.7A.
- B. A "graded approach" is recommended for the development of FHAs and should be applied based on 1) life safety, 2) severity of the fire hazards, 3) inventory of volatile/combustible materials, 3) complexity of planned operations, and 4) age/life of the facility or activity.

This is especially applicable to remediation operations conducted outside of facilities, to facilities which are being decommissioned and require a means of determining when fire protection and utility systems may be deactivated, to facilities which are being decontaminated in readiness for demolition, or to operational or configuration changes at a facility with an existing FHA.

- C. The FHA is developed to the detail and extent necessary to demonstrate that the stated objectives of DOE 5480.7A are achieved.
- D. The preliminary FHA develops the bounding uncontrolled fire event(s) which may occur in the facility or fire area, using analytical methods and constraints as provided by DOE 5480.7A and DOE 5480.23 (see 9.2, FHA and Safety Analysis Analytical Methods).
 - 1) Fire areas are identified in accordance with 9.1, Fire Areas.
 - 2) The FHA provides a technical basis for credited mitigating effects of facility design features, characteristics of combustible loading, or any other influence to the spread of fire. This basis will identify administrative controls needed to maintain a required configuration.
 - 3) The frequency and/or severity of these event(s) provide the basis for:
 - a) the SAR to assess the risk to health and safety and identify safety functions and SSCs important to safety (see 5.4, DBF Methods of Performance),

- b) the FHA to assess the fire loss and identify fire protection features in the facility (see 6.4, MPFL Methods of Performance),
 - c) The FHA to identify necessary life safety features, and
 - d) The FHA to assess the impact to program interruption (see 7.2, MCFL Purpose). The program manager identifies program interruption limits as established by the PSO.
- E. DOE 5480.7A identifies the 15 elements necessary for the development of a graded FHA. The FHA guidance supplied by EH-31.3 (and reflected in WHC-CM-4-41, Section 3.4), is used to supplement the FHA criteria. There is allowance for the facility SAR to substitute for the FHA when *all* of the applicable FHA elements are included, but the full scope of FHA criteria is typically *not* included in the SAR. In addition:
 - 1) A brief description of operations should be included in the FHA, as operational considerations and controls generally influence fire protection and life safety features.
 - 2) The FHA addresses protection of SSCs important to safety, evaluates the need for fire separation of redundant SSCs, and assess the impact of fire and explosion on essential safety functions as identified by safety analysis (see 5.4, DBF Methods of Performance).
- F. For any conflict between the EH-31.3 guidance and DOE 5480.7A, the Order has primacy.
- G. FHAs performed for WHC managed facilities are "Supporting Documents" per WHC-CM-6-1, EP-1.12 (reference 10), reviewed and approved by WHC Fire Protection, and referenced in the facility safety documentation (e.g., SAR). Associated calculations and any assumptions are provided in an appendix to the FHA or referenced from supporting documentation.

5.0 THE DESIGN BASIS FIRE

5.1 DEFINITION

From DOE 6430.1A:

"A fire that is the most severe design basis accident of this type. In postulating such a fire, failure of automatic and manual suppression provisions shall be assumed except for those safety class items/systems that are specifically designed to remain available (structurally or functionally) through the event."

5.2 PURPOSE

The DBF establishes the most severe accident of this type for which the SSCs important to safety must meet their functional goals.

5.3 REGULATORY BASIS

- A. DOE 6430.1A provides definition and applicability.
- B. References 3 and 11 require consistency between the DBF and the "MPFL event" developed by the FHA.
- C. DOE 6430.1A, Section 1530-99.0 "Fire Protection - Nonreactor Nuclear Facilities" states that an "assessment shall be made early in the design or modification to determine the facility structures, systems, and components that shall be protected against the effects of a DBF and explosion." This is part of the FHA function.
- D. DOE 6430.1A, Section 0110-5.2 "Safety Analysis" states that "areas to be addressed in the safety analysis include, but are not limited to the following: ...
 - "Principal hazards and risks... including potential accidents and predicted consequences of fire, explosion,... failure of essential operating equipment and failure of safety systems...
 - "Selected design basis accidents such as DBF,... These shall be postulated and quantified, including the rationale for selection."

5.4 METHODS OF PERFORMANCE

- A. The SAR analyzes the health and safety consequences of the DBF and other fire scenarios in its accident analysis section, ensuring that they are consistent with the fire event(s) developed by the FHA (see 4.4, FHA Methods of Performance, and 9.3, Consistency of the FHA and SAR).
- B. SSCs whose function is to mitigate the health and safety consequences of the fire event, and administrative controls required to limit the material at risk from fire are identified in accordance with the WHC

safety classification system and applicable Technical Safety Requirements.

- 1) The DBF assumes failure of automatic systems unless they are specifically designed to remain functional throughout the accident event.
- 2) The safety analysis identifies SSCs important to safety such that the FHA may evaluate the need for fire separation of redundant SSCs, and assess the impact of fire and explosion on essential safety functions.

6.0 THE MAXIMUM POSSIBLE FIRE LOSS

6.1 DEFINITIONS

- A. The MPFL is the fire loss resulting from the most serious fire event(s) developed in the FHA. From DOE 5480.7A, it is defined as:

"The value of property, excluding land, within a fire area, unless a fire hazards analysis demonstrates a lesser (or greater) loss potential. This assumes the failure of both automatic fire suppression systems and manual fire fighting efforts."

- B. From DOE 5480.7A, "fire loss" is defined as:

"The dollar cost of restoring damaged property to its pre-fire condition (refer to DOE 5484.1)..."

6.2 PURPOSE

The purpose of the MPFL is to identify all monetary liability to DOE in accordance with loss limitations of DOE 5480.7A as a result of the bounding fire event(s) developed by the FHA.

6.3 REGULATORY BASIS

- A. DOE 5480.7A
- B. DOE 6430.1A
- C. DOE 5484.1 (reference 13)
- D. RLID 5480.7

6.4 METHODS OF PERFORMANCE

- A. The MPFL is assessed in accordance with DOE 5484.1, Chapter V, Sections 2.a. (1) and (4), and develops the following:

- 1) Property replacement costs, less salvage value.
- 2) Decontamination and cleanup costs (including burial).

- a) DOE 5484.1 property restoration criteria, as it applies to onsite undeveloped land, is the cost of cleaning up the affected property such that it is "accessible" (uncontrolled/unposted) as provided by WHC-CM-7-5, Table 6.2 (reference 14). Radiological cleanup of offsite undeveloped land is based on the limit of 10 mrem EDE above background for a maximally affected individual as determined by safety analysis (reference 15). Other hazardous material limits are based on guidance from Regulatory Analysis.

- b) Bechtel Hanford, Inc. establishes the cleanup methodology and costs (including contingency costs, where appropriate) for decontamination, cleanup, and burial costs.
- 3) Facility restart costs.
- 4) Loss of production or program continuity.
- 5) Cost to restore damaged property to its preoccurrence condition, irrespective of whether this is actually done (see 2.a. above).
- 6) Losses exclude the restoration of:
 - a) Property that is scheduled for demolition.
 - b) Property (1) decommissioned and not carried on books as a value, or (2) where there is no loss potential.
- 7) Total cost roll-up is the MPFL.
- B. The MPFL is initially based on the effect of one or more uncontrolled fire events in the facility. This provides direction as to the need for automatic, redundant, and passive fire protection systems as described below.
- C. The MPFL is evaluated against the loss limitation criteria of DOE 5480.7A:
 - 1) When the MPFL exceeds \$1M, a complete automatic suppression system designed in accordance with applicable NFPA standards shall be provided.
 - 2) When the MPFL exceeds \$50M, a redundant fire protection system is provided that, despite the failure of the primary system, will limit the loss to \$50M (see the "Fire Protection Systems" section for criteria of a redundant fire protection system).
 - 3) When the MPFL exceeds \$150M, a redundant fire protection system and 3-hour fire barrier(s) are required to limit the loss to \$150M (also see 9.1, Fire Areas).
- D. The final MPFL is calculated without regard to automatic or redundant fire protection systems except where permitted by DOE 5480.7A and formal interpretation transmitted by RL.
- E. Associated calculations, bases, and assumptions shall be provided in the FHA or referenced from supporting documentation.

7.0 MAXIMUM CREDIBLE FIRE LOSS

7.1 DEFINITION

From DOE 5480.7A:

"The property damage that would be expected from a fire, assuming that:

- (1) All installed fire protection systems function as designed.
- (2) The effect of emergency response is omitted except for post-fire actions such as salvage work, shutting down water systems, and restoring operation."

7.2 PURPOSE

The purpose of the MCFL is to assess damage limitation and mitigation of program interruption provided by installed automatic suppression systems.

7.3 REGULATORY BASIS

DOE 5480.7A

7.4 METHODS OF PERFORMANCE

- A. Same as for MPFL; except that automatic suppression capabilities are assumed to function as designed.
- B. If there are no automatic systems, the MCFL is equivalent to the MPFL. Except for postfire actions, the effects of manual fire-fighting are not assumed.
- C. Automatic suppression is required if program interruption is otherwise unacceptable, so the MCFL is also used to verify that this interruption time does not exceed that determined to be acceptable by the PSO.
- D. The term "credible" in MCFL has no other applicability and is not intended to constitute a frequency of events.

8.0 FIRE PROTECTION SYSTEMS

8.1 DEFINITION

Any system designed to detect, extinguish, and limit the extent of fire damage or enhance life safety. Where redundant fire protection systems are required, any two of the following will satisfy that requirement. These include:

- A. Automatic suppression systems, such as fire sprinklers, foam, gaseous, explosion suppression, or other specialized extinguishing systems plus appropriate alarms. An adequate supply, storage and distribution system is an essential element.
- B. Automatic fire detection, occupant warning, manual fire alarm, and fire alarm reporting systems combined with properly equipped and adequately trained fire departments or brigades.
- C. Fire barrier systems or combinations of physical separation and barriers for outdoor locations.
- D. Other systems, such as alternate process control systems, as approved by the Authority Having Jurisdiction.

8.2 PURPOSE

The purpose of the fire protection system is to limit the extent of damage due to fire, minimize loss, and enhance life safety.

8.3 REGULATORY BASIS

- A. DOE 5480.7A, which requires an automatic suppression system (a) when the MPFL exceeds \$1M, (b) in all new structures over 5,000 square feet, and (c) when the MPFL will result in a program impact unacceptable to the PSO.
- B. DOE 6430.1A, which requires all nuclear facilities (covered by this Order) to have an automatic suppression system.

8.4 METHODS OF PERFORMANCE

- A. An automatic fire suppression system is supplied in accordance with DOE 5480.7A and DOE 6430.1A. Note that national codes and standards referenced by these Orders or by state and local building requirements may also mandate automatic fire suppression.
- B. Redundant fire protection is supplied when the MPFL exceeds \$50M. The redundant system limits the loss to \$50M, despite the failure of the primary fire protection system.

Note: Definition 8.1.B. above is the most common method on the Hanford Site of supplying a redundant fire protection system.

- C. The redundant fire protection system satisfies the "backup" fire suppression capability required for nuclear facilities covered by DOE 6430.1A, Section 1530-99.0.
- D. Fire hydrants are supplied for all new facilities in accordance with DOE 6430.1A, Section 0266-4.

9.0 ADDITIONAL INFORMATION

9.1 FIRE AREAS

The fire area is the basis of the FHA. A fire area is bounded by a minimum 2-hour fire-rated barrier or separation distance (based on the loss of an automatic suppression system).

As described in 4.4, FHA Methods of Performance, the preliminary FHA first assesses the effect of one or more uncontrolled fires without regard to installed fire protection systems or manual intervention. The effects of these events provide the basis for determining the placement and rating of qualified fire barriers, and/or identifying SSCs important to safety. The SAR should be cognizant of fire areas in the facility description and accident analysis so that a systematic approach is taken when identifying SSCs and administrative controls as a result of the DBF.

DOE 5480.7A requires a 3-hour fire barrier when the MPFL would otherwise exceed \$150 million. However, the FHA, through analytical methods, may demonstrate that the 2-hour barrier is sufficient where:

- a) the combustible loading within a fire area does not challenge the rating of the fire barrier,
- b) the barrier is constructed to remain functional during the FHA fire event(s),
- c) all penetrations are identified and adequately protected, and
- d) sufficient administrative controls are in place to limit the combustible loading to no more than that analyzed by the FHA.

Where a 2-hour MPFL barrier is identified, an equivalency is processed for RL concurrence in accordance with WHC-CM-4-41, Section 2.1. The use of a fire model to assess fire severity shall be in accordance with WHC-CM-4-41, Section 3.4.

9.2 FHA AND SAFETY ANALYSIS ANALYTICAL METHODS

The FHA is required to verify that the objectives of DOE 5480.7A are met. From a common basis, the FHA and SAR address these objectives such that the safety analysis and FHA shall satisfy their respective criteria in a consistent manner. The technical bases for engineering judgements and decisions related to fire protection shall be documented in the FHA (see 4.4, FHA Methods of Performance).

The regulatory design and program elements of the fire protection Order take a deterministic view of what is at risk when considering a severe fire. In general, all combustible materials in the fire area are involved, and all equipment located in the fire area may be subject to fire and smoke damage. However, the Order allows for considerable flexibility in the FHA, where a lesser or greater loss potential than that bounded by the fire area may be demonstrated.

The SAR has flexibility as well. DOE 5480.23 permits the use of a variety of analytical techniques in SARs: "safety analyses should include the application of methods such as deterministic safety analysis, risk assessment, reliability engineering, common cause failure analysis... as appropriate to the identification, investigation, elimination, mitigation, or control of vulnerabilities of the facility to accidents and accidental releases." (Att 1, pg 32, para 11a)

DOE 5480.23 specifies comprehensive accident scenarios: "The range of accident scenarios analyzed in a SAR should be such that a complete set of bounding conditions to define the envelope of accident conditions to which the operation could be subjected to are evaluated and documented." (Att 1, pg 32, para 11b)

DOE 5480.23 recommends a conservative approach to the analysis of mitigating barriers: "If the accident challenges the barriers at the level of their design limits, it is suggested that the analyst conservatively assume that the barrier will fail... When the analyst has sufficient data available on failure rates, probabilistic risk analysis is possible and should be considered for part of the accident analysis." (Att 1, pg 32, para 11f)

The probabilistic approach is based upon a defined initiating event or accident. This event provides conditions which have a particular probability for initiating secondary effects (and even tertiary effects) which result in consequences to safety, property, and programs. Based on the estimated frequency and consequences of the event, the risk of fire is assessed for a variety of different operating and accident scenarios. Usually, the initial assessment will provide insight into effective means of reducing risk through particular design and operational alternatives.

For any type of analysis performed in the FHA, including a probabilistic risk assessment (PRA) or fault tree analysis, a qualified fire protection engineer shall participate in its development. The assumptions, technical bases, and uncertainties shall be reported in the FHA to establish the overall risk from the fire event(s).

Requests for design deviations or exemptions from fire protection requirements shall be assessed within the scope of the FHA based on the risk to safety, program, and property loss. The FHA should consider occupancy, operations, fire hazards, ignition sources, transient combustibles, administrative controls, and other applicable conditions and features.

9.3 CONSISTENCY OF THE FHA AND SAR

Whatever analytical method is selected, the DBF analyzed by the SAR is required to be "consistent" with the MPFL event developed by the FHA. To achieve consistency, the following procedure should be incorporated into the established criteria for FHA and SAR development:

- A. The FHA author and SAR analyst jointly develop the postulated fire event(s) in the preliminary hazards assessment or other engineering study whose function is to determine bounding accidents.

- 1) Identify credible initiating events which may produce a variety of conditions that influence the characteristics of the subsequent fire and its severity.
 - 2) Proceed to define the whole fire event, using the analytical methods selected.
 - 3) At this stage, the fire(s) developed should not be mitigated by engineered barriers, systems, or manual intervention.
- B. The preliminary safety analysis uses the postulated fire event(s) to identify the minimum safety classification of the facility.
- C. After SSCs important to safety are identified, the overall acceptability of risk is determined and reported by the SAR in accordance with DOE 5480.23. Reference the FHA in the accident analysis.
- 1) Identify any automatic and passive fire protection features which are functionally required to protect SSCs important to safety or perform a safety function.
 - 2) Identify administrative controls (i.e., TSRs) necessary to assure SSCs important to safety may adequately carry out their identified safety function.
 - 3) Ensure that installed fire protection systems do not adversely impact SSCs important to safety.
- D. The preliminary FHA uses the postulated fire event(s) to identify fire protection design features.
- 1) Report the MPFL and follow the criteria of 6.4, MPFL Methods of Performance to determine required design features.
 - 2) Review existing or proposed life safety features such as occupancy separation, exit location, and annunciation.
 - 3) Determine program interruption. See 7.4, MCFL Methods of Performance.
 - 4) Identify design requirements which may be imposed as a result of the preliminary safety analysis.
- E. The final FHA credits those installed fire protection features as permitted.
- 1) Report the final MPFL.
 - 2) Report the fire protection features installed for life safety, property protection, and program continuity.
 - 3) Review the SAR:

- a. Report any safety functions required of the fire protection systems.
- b. Ensure that the health and safety risks meet the risk acceptance criteria.

F. Reference the SAR in the FHA.

Note: It is recognized that different fire events may be bounding for the purposes of preserving property, program, and safety. The FHA develops all of the potentially bounding events used to verify that the objectives of DOE 5480.7A are met.

This suggested procedure provides for a common basis in development of the FHA and safety analysis uncontrolled fire event(s). Subsequent features or controls to mitigate these events (SSCs, fire protection, administrative) may then follow the respective criteria for the FHA and SAR.

For cases where this process is not followed, the technical judgement of the approval authorities for the FHA and SAR within WHC and RL shall determine when the required consistency is achieved.

10.0 CONCLUSIONS

The FHA is the vehicle for reporting the risk from fire for health and safety, programmatic, and fire loss criteria. The scope of the SAR encompasses the DOE 5480.7A objectives for onsite/offsite release of hazardous material and public safety and shall report the acceptability of risk based on a DBF consistent with the FHA fire events. SSCs required to mitigate health and safety effects shall be identified and designed in accordance with the WHC safety classification system.

Deviations, exemptions, equivalencies, or waivers to established fire protection design criteria of DOE 6430.1A, DOE 5480.7A, RLID 5480.7, and WHC-CM-4-41 shall be supported by the FHA. The use of other analyses will not be considered as the sole basis for approving deviations, exemptions, equivalencies, or waivers to fire protection design criteria established by DOE.