FIRE

PROTECTION

ASSESSMENT

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SECTION

SCOPE

The Fire Protection Assessment guide will be used for the review of the Fire Protection Program DOE wide. This Assessment guide is for the assistance of the personnel in conducting performance based and/or physical protection requirements in the assessment of the Fire Protection Program. This Assessment guide covers the implementation of the DOE's responsibility of assuring that DOE and the DOE Contractors have established Fire Protection Programs that are at the level required for the area being assessed. This Assessment will determine the level of fire protection offered for employees and facilities.

For the purpose of this assessment, the Fire Protection Program will be referred to as the Program. This Program will include the fire protection criteria, administrative controls, hardware, personnel, and analysis used to ensures that DOE objectives relating to fire protection are achieved.

DEFINITIONS

1. Acceptable - When applied to fire protection, it is a level of protection which the Authority Having Jurisdiction, after consultation with the cognizant DOE fire protection authority(ies), considers sufficient to achieve the objectives defined above. In some instances, it is a level of protection necessary to meet a code or standard. In other instances it is a level of protection that exceeds or deviates from a code or standard.

2. Authority Having Jurisdiction - Except as noted, decision making authority in matters concerning fire protection rests with the manager of the DOE Field Office or designee as agreed to by DOE HQ. Decisions impacting fire protection shall be made by the Authority Having Jurisdiction only after consultation with the cognizant DOE Fire Protection Engineer.

3. Consultant Fire Safety Appraisal Program - The program under which fire safety appraisal of DOE facilities are conducted for the Director of Quality and Safety Programs by Fire Protection Engineers from HQ and/or designated consultants.

4. DOE Fire Protection Program - A Program that relates to hardware, administrative controls, personnel, analyses, and technical criteria which comprehensively ensures that DOE objectives relating to fire protection are achieved.

5. Equivalency - The approved alternate means of satisfying the technical provisions of a fire protection code or standard. (Deviations from specific requirements of occupational safety and health standards, as delineated in the Code of Federal Regulations, are treated as variances

as defined in DOE 5480.13A, AVIATION SAFETY.)

6. Exemptions - The approved deviation from a non-statutory code, standard or DOE Order which would not decrease safety or increase the property damage potential.

7. Fire Area - A space or location bounded by fire rated construction including fire rated doors, dampers, or penetration seals as determined by the Fire Hazards Analysis.

8. Fire Protection - A broad term which encompasses all aspects of fire protection, including; building construction and fixed building fire features, fire suppression and detection systems, fire water systems, emergency process safety control systems, emergency fire fighting organizations (Fire Departments, Fire Brigades, etc), Fire Protection Engineering, and fire prevention. Fire protection is concerned with preventing or minimizing the direct and indirect consequences of fire. It also includes aspects of the following perils as they relate to fire protection explosion, earthquake, lightning, smoke and water damage.

9. Fire Protection Engineer - A graduate of an accredited university or college with a Bachelor of Science Degree in an engineering or related technical field and meeting the qualifications for Member Grade in the Society of Fire Protection Engineers (SFPE) or be a registered Professional Engineer in Fire Protection.

   SFPE defines "Member" as a "graduate of an engineering curriculum of accepted standing and having completed not less than four years of engineering practice, three of which shall have been in responsible charge of Fire Protection Engineering work. If this person is not such a graduate, then he/she shall demonstrate a knowledge of the principles of engineering and have completed not less than six years engineering practice, three of which shall have been in responsible charge of Fire Protection Engineering work.

10. Fire Protection System - Any system designed to detect, extinguish, and limit the extent of fire damage or enhance life safety. These include:

    A. Automatic fire suppression systems, such as sprinklers, foam, gaseous, explosion suppression, or other specialized extinguishing systems plus appropriate alarms. Adequate water supply, storage, and distribution system.

    B. Automatic fire alarm and detection systems, occupant warning, manual fire alarm, and fire alarm reporting systems combined with properly equipped and adequately trained Fire Departments or Fire Brigades.

    C. Fire barrier systems, physical separation or combination of fire barriers and separation for outdoor locations.

D. Other systems as approved by the Authority Having Jurisdiction.

11. Listed and/or approved - Equipment that has been tested by and included in their directories. This would mean equipment listed by Underwriter Laboratory and/or approved by Factory Mutual Systems (Engineering and Research Corporation) for their intended use. This includes a broad scope of fire protection related items.

12. Maximum Credible Fire Loss (MCFL) - The total value of property within a fire area, unless a fire hazards analysis demonstrates a lessor (or greater) loss potential. This assumes that:

    A. All installed fire protection systems function as designed.

    B. The effect of emergency response is omitted except for post-fire actions such as salvage work, shutting down water systems, and restoring operation.

13. Maximum Possible Fire Loss (MPFL) - The total value of property within a fire area, unless a fire hazards analysis demonstrates a lessor (or greater) loss potential with all fire protection equipment out of service and no response from the Fire Department except for salvage operations.

14. Property - All Government-owned or leased structures and contents for which the Department has responsibility, including:

    A. All DOE land, structures, and contents.

    B. All leased locations.

    C. All other government property on DOE land or in DOE structures.

    D. Other personnel and property that occupy DOE land or are in DOE structures.

15. Fire Loss - The dollar cost of restoring damaged property to its pre-fire condition. In determining loss, the estimated damage to the facility and contents shall include replacement cost, less salvage value; the cost of decontamination and cleanup; the loss of production or program continuity; the auxiliary costs of fire extinguishment; and consequent effects on related areas. Losses will exclude:

    A. Property that is scheduled for demolition.

    B. Property that is decommissioned and not carried on books as a value and where there is no loss potential or threat to the public.

16. Improved Risk Criteria - The Improved Risk Criteria defined by DOE Order 5480.7A denotes the level of fire protection required for DOE facilities. An Improved Risk facility is characterized by a sufficiently high level of fire protection to fulfill requirements for insurability by Factory Mutual, Industrial Risk Insurance or other private industrial fire insurance companies who limit their underwriting to the best protected class of industrial risks. This requires a high level of management interest in loss prevention and requires the use of noncombustible and or fire resistive construction, adequate fire separations, protection of special hazards, adequate and reliable fire separations, adequate and reliable fire protection water supplies, adequate automatic fire extinguishing systems, stand pipe hose racks, adequate fire extinguishers, and fire detection and alarm systems. The standards of these insurance companies are used as guides for assuring compliance with Improved Risk requirements.

17. Related Perils - Aspects of the following as they relate to fire protection: explosion, natural phenomenon, smoke, and water damage.

18. Risk - A term used to describe the overall potential for loss (refer to DOE 5481.1B).

19. Safety Class Equipment - Systems, structures, or components including primary environmental monitors and portions of process systems, whose failure could adversely affect the environment, or the safety and health of the public.

    For nuclear reactors and non-reactor nuclear facilities, Class A Equipment includes those systems, structures, or components with the following characteristics:

    - Those whose failure would produce exposure consequences that would exceed DOE established guidelines at the site boundary or nearest point of uncontrolled public access.
    - Those required to maintain operating parameters within the safety limits specified in Technical Safety Requirements (Technical Specification or Operational Safety Requirements) during normal operations and anticipated operational occurrences.
    - Those required for nuclear criticality safety.
    - Those required to monitor the release of radioactive materials to the environment during and after a design basis accident.
    - Those required to monitor and maintain the facility in a safe shutdown condition.
    - Those that control the safety class items described above.

21. Vital Program - A DOE program so defined by the Program Secretarial Officers.

MANDATORY CRITERIA REFERENCES

The implementation of the DOE policy requires that certain fire protection criteria be delineated with codes, standards and other documents. These are the criteria that must be met or exceeded. Where conflicts in the application of these codes and standards arise, the more restrictive requirements apply.

1. DOE 5480.4, Environmental Protection, Safety, and Health Protection Standards

2. National Fire Protection Association (NFPA) Codes and Standards

3. DOE 6430.1A, General Design Criteria

4. DOE/EP-0108, Standard for Fire Protection of DOE Electronic Computer/ Data Processing Systems

5. DOE/EV-0043, Standard on Fire Protection for Portable Structures

6. 29 CFR 1910, Occupational Safety and Health Standards

7. 29 CFR 1926, Safety and Health Regulation for Construction

8. Other DOE Orders and statutory requirements, not listed above, that contain requirements of a more limited extent relating to the Doe Fire Protection Program.

9. DOE REFERENCED DOCUMENTS - The following references contain additional criteria pertaining to the DOE Fire Protection Program:

    A. DOE Fire Protection Resource Manual.

    B. General Fire Fighting Guidance for Nuclear Weapons (this document is Confidential Restricted Data)

    C. DOE 5482.1B, ENVIRONMENT, SAFETY, AND HEALTH APPRAISAL PROGRAM.

    D. DOE 5484.1, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS

    E. DOE 5500.1B, EMERGENCY MANAGEMENT SYSTEM

    F. National Fire Protection Association (NFPA) Handbooks.

    G. The Factory Mutual Loss Prevention Data Sheets Standards.

    H. Society of Fire Protection Engineers (SFPE) Handbook.

    H. DOE/EV-06194-3 DOE Explosives Safety Manual.

I. Local and state fire protection criteria, as applicable.

J. American Petroleum Institute (API) Guidelines.

K. NFPA guides, manuals, and recommended practices.

L. Underwriters Laboratories Product Directories.

M. Factory Mutual Research Corporation Approval Guide.

PERFORMANCE OBJECTIVES

The Fire Protection Fire Risk Assessment criteria is based on the minimum requirements needed to meet the DOE Orders and "Improved or Highly Protected Risk" industrial properties as rated by the insurance industry with respect to fire protection. The objectives are identified, followed by criteria questions to be answered to determine if the objective is being met. References are included to assist in the clarification of criteria or identify areas where significant differences exist between NFPA Standards and the "Improved Risk" guide lines. It should be noted that the objective questions do not cover all parts of an order, code, standard, or other related guidance documents.

Objective and criteria statements were developed using DOE Orders, National Codes and Standards, and the "Improved Risk" guidance of the Fire Insurance Industry. Statements that are directly derived from an Order, Code, Standard, or Factory Mutual Loss Prevention Data Sheets are so noted. Other statements are based on Best Management Practices (BMP). BMP are derived from the methods used by Fire Protection Engineers to evaluate a facility and to determine if that facility is meeting or achieving the "Highly Protected or Improved Risk" level of fire protection. BMP are a series of questions that will evaluate a specific area or concern. A negative answer to a BMP question does not lead directly to a concern, but to the possibility that the area may need to be reviewed in greater detail.

The Fire Risk Assessment criteria is to be used for a broad scope review of the Fire Protection Program. This Guide is intended to provide an outline for reviewing the Fire Protection Program at the Field or Area Office or the contractor level by a qualified Fire Protection Engineer.

This document is intended to be used as a guide for reviewing a site or a facility within a site. Information in the Guide should not be used as a minimum "Site Requirement", but should be used as a tool to identify the many parts of a Program. Sites may not have all of the Program parts noted in the Assessment Criteria and may not require them.

This Assessment is an review of the DOE and its contractors to determine how they have the implemented the requirements of the Fire Protection Program. Information developed from this Assessment will evaluate the degree to which the Program has achieved it's objectives. It can include the interfaces of the DOE Headquarters (HQ), Field Offices, Area Offices, and Contractors.

SECTION I
Field and/or Area Office

This section is to be used for the an assessment of the Field and/or the Area Office. The Assessment will cover the implementation of the Fire Protection Program at these offices. This will include such items as the methods used for the Program implementation. This would include the status of the Program with-in the Field or Area Office and the interface upwards to Headquarters and downward to the contractors. Criteria items in this section are based on Best Management Practices (BMP) as these area are not covered in National Codes or Standards. Heads of Field Organizations as directed by the PSO, the Heads of Field Organizations shall do the following.

Objective **A. Ensure a level of fire protection adequate to meet the objectives of this Order for personnel and property within their responsibility. Where an area office exists within the organization, a clear, formal delegation of fire protection responsibilities shall be established.** **(DOE 5480.7A Paragraph 8 Section g (1))**

Criteria *1. Do the agreements define or establish the management chain of authority for implementing the requirements of the Program? (BMP)*

2. Do the agreements define or establish oversight responsibility and authority to ensure that the contractor's capability and performance in implementing the requirements for the Program are appraised and audited? (BMP)

3. Do the agreements define or establish oversight responsibility and authority to ensure that the contractor's capability and performance in implementing the requirements for the Program are appraised and audited? (BMP)

4. Are the responsibilities and authorities of fire protection, management, supervisory, and other personnel defined in writing? (BMP)

5. Are fire protection policies and procedures adequate, reviewed, and current? (BMP)

6. Has the Authority Having Jurisdiction as used in the Uniform Building Code, NFPA Fire Codes, and other nationally recognized consensus standards been defined and has the decision making authority in matters concerning fire protection been established? (BMP)

Objective **B. Establish and maintain a system to assure that the DOE fire protection program is documented and incorporated**

in the plans and specifications for all new facilities and for major modifications of existing facilities. This includes oversight by a qualified fire protection engineer of plans, specifications, and testing of fire protection features. (DOE 5480.7A Paragraph 8 Section g (2))

Criteria *1. Is there an approved and documented program to provide Fire Protection Engineering review of planning and design? (BMP)*

2. Are the personnel performing these reviews qualified and experienced? (BMP)

3. Are records kept with reviews and comments followed up and issues resolved? (BMP)

4. Are the specific procedures for the conduct of this program adequate? (BMP)

5. Are there procedures to provide for resolution of differences between the engineering and fire protection staff? (BMP)

Objective **C. Review implementation plans for compliance with recommendations resulting from fire protection assessments. Forwards a copy of compliance plans, exemption requests, equivalency determinations, compliance schedule approvals, and other requested data to the PSO.** (DOE 5480.7A Paragraph 8 Section g (3))

Criteria *1. Is there involvement of the Fire Protection Engineering staff in the approval of the required items? (BMP)*

2. Are records kept of reviews and are there followed up and are issues resolved? (BMP)

3. Are the specific procedures for the conduct of this program being followed? (BMP)

Objective **D. Approve contractor requests for fire safety equivalencies.** (DOE 5480.7A Paragraph 8 Section g (4))

Criteria *1. Does the Field Office have a formal approval process to handle questions, deviation and exemption requests? (BMP)*

2. Is the interface between fire protection and other disciplines (safety, security, health protection, criticality, engineering, maintenance, etc) defined? (BMP)

Objective **E. Maintain a list of facilities/contractors for which they have fire protection appraisal responsibility in accordance with this Order, indicating the assessment**

frequency for each. (DOE 5480.7A Paragraph 8 Section g (5))

Criteria *1. Is there a list of facilities which have been appraised and ones to be appraised by the Fire Protection Engineering staff? (BMP)*

2. Are records kept of the appraisals and are there followed up and are issues resolved? (BMP)

3. Are the specific procedures for the conduct of this program being followed? (BMP)

Objective **F. Conduct fire protection assessments of facilities and/or contractors according to the frequency and scope established by this Order to assure that, (a) the program described in paragraph 9 is being implemented, (b) effective action is being taken to correct deficiencies identified from previous appraisals, including prioritization, tracking, and implementation of interim compensatory measures, and (c) losses, impairments, and unusual fire-related incidents have been investigated and analyzed to identify causes, corrective action(s), and preventive methods.** (DOE 5480.7A Paragraph 8 Section g (6))

Criteria *1. Is there a formal documented fire protection assurance program to evaluate the effectiveness of the various elements of the Program? (BMP)*

2. Are the fire protection assurance reviews adequate in terms of detail as well as programmatic concerns? (BMP)

3. Do the results of fire protection assurance reviews reach top management? (BMP)

4. Are deficiencies identified in the fire protection assurance reviews assigned priorities and corrected in a timely fashion? (BMP)

5. Is there a follow-up procedure to assure that fire protection assurance deficiencies are promptly corrected? (BMP)

Objective **G. Submit an annual summary to Office of Safety and Quality Assurance (EH-30) through the PSO covering the fire protection program and loss experience of the previous year, as required by DOE 5484.1.** (DOE 5480.7A Paragraph 8 Section g (7))

Criteria *1. Is there a policy and program to require the preparation of an annual report documenting the fire protection accomplishments and objectives and the overall posture of*

fire protection? (BMP)

2. *Is the Annual Report provided by the contractors to the Field Office and Head quarters? (BMP)*

Objective **H.** **Forward requests for fire protection exemptions prepared by the contractor to the PSO. Submit a recommendation for approval for these conditions to the PSO for those issues where, in the judgment of the Head of the Field Organization, compliance with specific program elements is not attainable and where an acceptable level of safety has been provided. The cognizant Headquarters fire protection engineer should be consulted on these issues as appropriate.** **(DOE 5480.7A Paragraph 8 Section g (8))**

Criteria 1. *Is there a formal policy on the preparation of exemptions that requires review input from the Fire Protection Engineering staff? (BMP)*

2. *Is there a follow-up program? (BMP)*

3. *Is the program satisfactory? (BMP)*

Objective **I.** **Maintain or have access to an adequate fire protection staff, including one or more qualified fire protection engineers, to accomplish the above objectives. Continuing education and training should be provided to maintain and enhance the level of competency of the fire protection staff.** **(DOE 5480.7A Paragraph 8 Section (9))**

Criteria 1. *Has management provided an adequate staff? (BMP)*

2. *Are the job assignments and responsibilities of the staff members defined? (BMP)*

3. *Is the Fire Protection Engineering staff carrying out assigned duties? (BMP)*

Objective **J.** **Establish and maintain a method to disseminate fire protection information from Headquarters to the contractors and vice versa.** **(DOE 5480.7A Paragraph 8 Section g (10))**

Criteria 1. *Is there a current, approved policy and program to provide for the regular interface of the various levels of Fire Protection Staffs such as the Field office, contractors and sub-contractors? Do these interface meeting include input from operating and program personnel? (BMP)*

2. *Do this program include such items as Fire Loss Investigations,*

analysis and review of fire and related incidents other problems that have not result in a loss? (BMP)

3. *Is this program satisfactory in meeting the objective? If deficiencies are identified, are they assigned a priority, and promptly corrected? (BMP)*

Objective **K. Where there is no PSO, the Head of the Field Organization shall assume the responsibilities as delineated in paragraph 8a. Where there is no contractor, the Head of the Field Organization shall assume the responsibilities as delineated in paragraph 8i.** **(DOE 5480.7A Paragraph 8 Section g (11))**

Criteria *1. In cases where this is noted, has a Program been established to meet this objective? and is it satisfactory? (BMP)*

SECTION II
Heads of Headquarters Elements and Heads of Field Organizations

The senior ranking DOE official at a DOE office location shall include the following in a procurement request package for each procurement requiring the application of this directive; (1)identification of the Directive, (2) identification of the specific requirements with which a contractor or other awardee is to comply, or, if this is not practicable, identification of the specific paragraphs or other portions of this Directive with which a contractor or other awardee is to comply, and (3) requirements for the flow down of provisions of this directive to any subcontract or subaward. For application to awarded management and operating contracts, Heads of Headquarters Elements and heads of field organizations may set forth this information in a written communication to the contracting officer rather than in a procurement request package.**(DOE 5480.7A Paragraph 8 Section h)**

SECTION III
Program Criteria and Requirements

This section is to be used as a broad based review of the contractor's Fire Protection Program. This section will cover the items that are needed as a minimum to have a satisfactory Fire Protection Program. It should be noted that so sites may have additional items to cover site specific or special concerns. This section of the review process is based on DOE Order 5480.7A Paragraph 8 section i. Criteria items in this section are based on Best Management Practices (BMP) as these area are not covered in National Codes or Standards.

Objective **A. Provide and maintain a level of fire protection to meet the objectives of paragraph 4, and the criteria of paragraph 9.** **(DOE 5480.7A Paragraph 8 Section i(1))**

Criteria *1. Is the facility characterized by a level of fire protection sufficient to meet the requirements for the best protected class of industrial risks? (BMP)*

Reference This program is characterized by the inclusion of a continuing and sincere interest on the part of management and employees in minimizing losses from fire and related perils and the inclusion of preventive features necessary to ensure the satisfaction of objectives related to fire protection and fire safety.

2. Does this Fire Protection Program exceed the minimum requirements established by the National Fire Protection Association as required by DOE 5480.7A?

Reference The basic requirements include; (1) A reliable water supply of adequate capacity for fire suppression, (2) A fully staffed, trained and equipped emergency response force, (3) A means to summon the emergency response force in the event of a fire, (4) A means to notify building occupants of a fire and to evacuate the building, (5) Automatic fire extinguishing systems in all areas subject to serious property damage, program interruption, or loss of safety class systems, and (6) Administrative procedures encompassing controls for hazardous substances or processes been provided.

3. Does the level of protection as defined by the Program assure that there will not be a release of toxic, biological, or radioactive materials that will be a threat to the public or environment as a consequence of fire? (BMP)

Reference This means that there will not be a fatality loss due to a fire, and that all losses (including direct property loss, debris removal, clean-up expense, smoke and water damage) will be limited to less than $1,000,000.

4. Is there fire protection criteria that reflect site specific aspects of the Program including; the organization and responsibilities of the fire protection staff, administrative aspects of the fire protection program, and requirements for physical fire protection features? (BMP)

5. *Does the implementation of the fire protection criteria delineate codes, standards, and other documents that must be met or exceeded? Where conflicts in the application of these codes and standards arise, are the most restrictive requirements being applied? (BMP)*

6. *Do the fire protection related codes and standards in effect when facility design commences (code of record) remain in effect for the life of the facility? When modifications of a substantial nature occur, is the current edition of the code applied to the modification? (BMP)*

7. *To minimize the risk from fire, do the facilities have procedures (site policy documented policy in ES&H Manuals, etc) governing the use and storage of combustible, flammable, radioactive and hazardous materials and procedures to control such activities as smoking and hot work? (BMP)*

Objective **B. Provide and maintain a system to ensure that the requirements of the DOE fire protection program are documented and incorporated in the plans and specifications for all new facilities and for major modifications of existing facilities. This includes review and comment by a qualified fire protection engineer of plans, specifications and test procedures and results for fire protection features.** (DOE 5480.7A Paragraph 8 Section i(2))

Criteria *1. Is there a program to ensure that Fire Protection is incorporated into plans and specifications for all new facilities and for major modifications of existing facilities? (BMP)*

2. *Do the records of this program provide the necessary information for review and audit purposes? (BMP)*

3. *Is the review and audit of this program adequate? Does it provide qualified and independent review? (BMP)*

Objective **C. Assist DOE in coordination fire safety assessments at those facilities included in the survey program, establish action plans for compliance with recommendations resulting from the assessments, and forward compliance plans, exemption requested data to DOE field organizations.** (DOE 5480.7A Paragraph 8 Section i(3))

Criteria *1. Is there a program to ensure that there is a fire safety program (as noted above) for all facilities and/or site? (BMP)*

2. *Do the records of this program provide the necessary information for review and audit purposes? (BMP)*

3. *Is the review and audit of this program adequate? Does it provide qualified and independent review? (BMP)*

Objective **D. Establish and maintain a list of facilities for which the contractor has fire protection responsibility.** (DOE 5480.7A Paragraph 8 Section i(4))

Criteria *1. Has a list been established of all facilities to be appraised for fire protection? (BMP)*

2. Is the listing up to date? (BMP)

Objective **E. Conduct fire Protection assessments of facilities according to the scope and frequency established by this order.** (DOE 5480.7A Paragraph 8 Section i(5))

Criteria *1. Are annual fire protection appraisals being made for all facilities that have value of $50 million or more (including equipment); where a significant safety hazards exists; where hazardous materials or radioactive materials are involved; or in which vital programs are involved? (BMP)*

2. Are fire protection appraisals being conducted at least every two years at facilities valued at $10 million to $50 million including equipment? (BMP)

3. Are fire protection appraisals being done every three years for facilities valued at less that $10 million including equipment? (BMP)

4. Are appraisals of fire protection program elements being made annually? (BMP)

5. Are copies of the two most recent appraisal reports being kept on file? (BMP)

Objective **F. Provide fire protection technical assistance to DOE.** (DOE 5480.7A Paragraph 8 Section i(6))

Criteria *1. Is fire protection technical assistance being provided to DOE as stipulated by the contract? (BMP)*

Objective **G. Submit requests for exemptions and fire safety equivalencies to the head of the Field Organization for those facilities where compliance with specific program elements is not attainable and where an acceptable level of safety has been achieved.** (DOE 5480.7A Paragraph 8 Section i(7))

Criteria *1. Are fire protection exemptions being made for all facilities that do not meet DOE Order requirements? (BMP)*

2. *Are exemptions for fire protection program issues review on a regular basis but at least annually? (BMP)*

3. *Are copies of the exemption requests kept on file? (BMP)*

Objective **H. Maintain or have access to an adequate fire protection staff, including a qualified fire protection engineer(s). Continuing education and training should be provided to maintain and enhance the level of competency of the fire protection staff.** **(DOE 5480.7A Paragraph 8 Section i (8))**

Criteria 1. *Is there an adequate fire protection staff to accomplish the Programs objectives including one or more Professional Fire Protection Engineers? (BMP)*

2. *Is continuing education and training to maintain and enhance the level of competency of the fire protection staff provided? (BMP)*

SECTION IV
FIRE PROTECTION PROGRAM

This section is to be used to determine the if a site and/or facility is meeting the requirements of the Fire Protection Program based on DOE 5480.7A Paragraph 9. This will include the requirements of the PSO, Field and/or Area Offices and the contractors. Each group has certain requirements and responsibilities.

As noted in DOE Order 5480.7A, "A DOE facility shall be characterized by a level of fire protection sufficient to fulfill the requirements for the best protected class of industrial risks (Highly Protected Risk/Improved Risk). This program is characterized by the inclusion of a continuing, sincere interest on the part of management and employees in minimizing losses from fire and related perils and the inclusion of preventive features necessary to ensure the satisfaction of objectives related to safety.

Based upon the above paragraph, the DOE Fire Protection Program shall meet or exceed the minimum requirements established by the National Fire Protection Association as directed by the PSO. Basic requirements shall include: a reliable water supply of acceptable capacity for fire suppression; noncombustible construction of an acceptable nature for the occupancy of the facility; automatic fire extinguishing systems; a fully staffed, trained, and equipped emergency response force; a means to summon the emergency response force in the event of a fire; and a means to notify and evacuate building occupants in the event of a fire. For areas subject to significant life safety risks, serious property damage, program interruption, or loss of safety class equipment as defined in the relevant facility SAR, additional protection measure may be deemed necessary as determined by the AHJ.

This level of protection also includes: administrative procedures encompassing controls for hazardous substances/processes; inspection, maintenance, and testing of fire protection features; and other programmatic fire safety activities as defined below".

Programmatic Elements - The Fire Protection Programs shall incorporate the following elements to assure that the objectives of DOE 5480.7A paragraph 4 are met.

Objective **A.** **Fire Protection Criteria is documented in the "Fire Protection Program" and includes: (a) A statement of management commitment to achieve the above stated objectives, (b) A policy statement that implements this Order and other DOE fire protection related mandatory codes and standards, and (c) Fire protection criteria that reflect site-specific aspects of the fire protection program, including: the organization and responsibilities of the fire protection staff, administrative aspects of the fire protection program,**

and requirements for physical fire protection features. (DOE 5480.7A Paragraph 9 Section a(1))

Criteria *1. Does the Fire Protection Program exist? (BMP)*

2. Does the Program contain the required sections and statements? (BMP)

3. Is the Program site specific? (BMP)

Objective **B. Documented assessments/evaluations of the fire protection program, including field walkdowns of facilities, are performed and include: (a) Facilities/contractors shall be assessed to establish that they conform with DOE fire protection criteria, (b) Minimum Frequency, Headquarters-PSO assessment of field offices 3 years, EH assessment of program offices 3 years, Field office assessment of the fire protection program of each contractor 2 years and Contractors/Facility Managers; Annual fire protection assessments shall be made of facilities valued in excess of $50 million; where considered to be a moderate (Category 2 Hazard) or high hazard (Category 1 Hazard) as defined in DOE 5481.1B, SAFETY ANALYSIS AND REVIEW SYSTEM, for nonnuclear facilities and in DOE 5480.23, NUCLEAR SAFETY ANALYSIS REPORTS, for nuclear facilities; or in which vital programs are involved. Fire protection assessments shall be made at least every two years of facilities plus equipment valued at $10 million to $50 million. Remaining facilities shall be assessed at least every three years or at frequencies determined by the AHJ. Comprehensive assessments of fire protection program elements shall be made every two years. Copies of the two most recent assessment reports shall be kept on file.** (DOE 5480.7A Paragraph 9 Section a (2)(a & b))

Criteria *1. Does a Fire Protection Assessment Program exist? (BMP)*

2. Does the Program contain the required sections and statements as noted above? (BMP)

3. Is the Program site specific? (BMP)

4. Are the Assessment being done to meet the schedule? (BMP)

Objective **C. Assessments shall include an evaluation of the following elements of the fire protection program; (1) Program-related, (2) Facility-related, and (3) Combined Aspects (Program & Facility). Details are noted in the DOE Order.** (DOE 5480.7A Paragraph 9 Section a(2)(c))

Criteria

1. *Does the Program contain the required sections and statements as noted above? (BMP)*

2. *Is the Program site specific? (BMP)*

3. *Are the Assessment being done to meet the schedule? (BMP)*

4. *Are FHA being performed under the direction of a qualified fire protection engineer? (BMP)*

SECTION V
Physical Features of the Program

This section deals with the many physical feature of site operations and the facilities. The following selected criteria items are to be used for the evaluation of the Program Objectives in these areas. There are several sections that have been provided with additional Objectives to allow for a greater review of selected areas.

Objective **A.** **Safety Class Equipment. - In areas where a fire could cause damage to safety class equipment and where no redundant safety capability exists, a redundant fire protection system shall be provided for the safety class equipment. For new facilities, redundant Safety Class Equipment shall located be in separate fire areas. Fire suppression systems shall be designed such that their actuation will not damage safety class equipment or cause a criticality incident.** (DOE 5480.7A Paragraph 9 Section b(1))

Criteria *1.* *In areas where a fire could cause damage to a safety class system and no redundancy exists, is a redundant fire protection system provided for the safety class system? (BMP)*

2. *Is the fire suppression system or safety system designed such that the suppression system actuation will not intentionally damage the safety class system? (BMP)*

Objective **B.** **Life Safety. - Life safety provisions shall be provided for all facilities in accordance with the Life Safety Code (X,D), NFPA Standard 101. The methods outlined in NFPA 101M may be used to obtain an equivalent level of life safety where strict compliance is not possible. Exit requirements for toxic and explosive environments shall be as determined by the AHJ. In addition, for explosives environments, exits shall reflect the criteria contained in the DOE Explosives Safety Manual, (DOE/EV 06194). Where noncompliance with some Life Safety Code provisions may be required for public safety, as in some containment structures, additional protective systems and personnel limits should be maintained. Compliance with the Life Safety Code shall be considered to satisfy the exit requirements of the applicable building code and OSHA 29 CFR 1910.** (DOE 5480.7A Paragraph 9 Section b(2))

Criteria *1.* *Are Life Safety provisions provided for all facilities in accordance with the NFPA 101 Chapter 2? Are the methods outlined in NFPA 101M Chapter 2 used to obtain an equivalent level of life safety where strict compliance is not possible*

in existing buildings?

2. *Are exit requirements for toxic and explosive environments being determined by the Authority Having Jurisdiction? (BMP)*

3. *In the case of explosive environment exits, was the criteria contained in the DOE Explosives Safety Manual (DOE/EV-0194) used?*

4. *Is there a program that provides regular review of the adequacy of exit identification? (BMP)*

5. *Are the personnel performing these services adequately trained and experienced? (BMP)*

6. *Do all exit signs have proper illumination under normal operating conditions as required by NFPA 101 5-8? Are the signs provided with direction arrows when needed in accordance with NFPA 101 5-10.4.1 AND 5-10.4.2?*

7. *Have all areas requiring emergency illumination been identified as specified in NFPA 5-8.1.1?*

8. *Are exit doors installed properly with proper hardware as required by NFPA 101 5-2.1.5?*

9. *Are there any conflicts with security requirements for dead bolts, hasps, or any other type of unauthorized hardware on exit doors in accordance with NFPA 101 5-2.1.5.5?*

10. *Are exit facilities in accord with NFPA 101 Chapter 5? Are fire alarms provided where a fire may not itself provide adequate warning?*

Reference NFPA 101 7-6.1 requires alarm systems for industrial occupancies greater than or equal to 100 people or greater than or equal to 25 persons below street or ground level and all high hazard locations.

11. *Are exits adequate in number, size, and location as required by NFPA 101 5-4, 5-6.4 and 5-10?*

12. *Are stair enclosures adequate as specified by NFPA 101 5-2.2.6.1?*

Objective **C. Automatic Fire Protection.** (DOE 5480.7A Paragraph 9 Section b(3))

Criteria 1. *Are fire protection and Life Safety features incorporated in all plans, designs, and layouts of new buildings, equipment and processes, and in alterations of existing facilities in accordance with NFPA 101?*

2. *Are all plans and specifications being reviewed by a qualified*

Fire Protection Engineer for fire protection and Life Safety aspects? (BMP)

3. *Are complete automatic fire suppression systems (designed in accordance with applicable NFPA standards) being provided as follows; (a) In all new structures over 5,000 square feet, except leased structures, (b) in all structures having a MPFL in excess of $1,000,000 as required by DOE Order 6430.1A 1530-2.3.3, and (c) Where the MCFL will result in the loss of use of a vital structure for a period longer than that specified as acceptable by the applicable Program Secretarial Office.*

Objective **D. Redundant Fire Protection.** (DOE 5480.7A Paragraph 9 Section b(4))

CRITERIA 1. *When the MPFL is in the range of $50-75 million, is a redundant fire protection system provided that, despite the failure of the primary system, will limit the loss to $50 million? (BMP)*

2. *When the MPFL exceeds $75 million, in addition to a redundant fire protection system, are fire barriers or physical separation provided to limit the maximum possible loss to $50 million? (BMP)*

Objective **E. Testing and Maintenance** - The fire protection systems are tested, maintained and inspected as part of a program. This program is in accordance with the applicable NFPA Standards, Improved Risk guidelines and supplemented by the DOE Fire Protection Resource Manual. (DOE 5480.7A Paragraph 9 Section b(5))

Reference The following are some of the areas that need to be evaluated, however they do not include all of the testing requirements noted in NFPA 13 Chapter 9, NFPA 13A, NFPA 15 Chapter 6, and other related NFPA Codes or in the Improved Risk criteria.

Criteria 1. *Do the frequencies and qualities of inspection, testing, and maintenance services of the fire suppression systems meet NFPA 13A, NFPA 13 Chapter 9, and NFPA 15 Chapter 6?*

2. *Are the personnel performing these services trained, experienced, and conversant with codes and policies? (BMP)*

3. *Do the records of these services provide the necessary information for review and audit purposes in accordance with NFPA 13A?*

4. *Are the specific procedures for the inspection, testing, and maintenance of all types of sprinkler systems as required by NFPA 13A?*

Objective **F. Quality Construction** (DOE 5480.7A Paragraph 9 Section b(6))

Criteria 1. *Are new structures in excess of 5,000 square feet of*

noncombustible or fire resistive construction? (BMP)

2. *Is the spacing of trailers or temporary structures for fire protection purposes in accordance with DOE/EV-0043?*

3. *Are buildings with hazardous occupancies segregated and isolated, or provided with barricades to prevent personal injury and minimize property damage as specified by NFPA 101 6-4.1.1?*

4. *Does the location and spacing of flammable and combustible liquid storage tanks and piping conform with the recommendations of NFPA 30 2-3.1 and Factory Mutual Data Sheet 7-29?*

5. *Is explosion venting provided in accordance with NFPA 30 2-3.5 for flammable liquids storage? If required, do the vents meet the requirements of NFPA 30 2-3.5 and Factory Mutual Data Sheet 1-44?*

6. *Is smoke venting provided as recommended by NFPA 204M 2-1? If provided, does it meet the requirements of NFPA 204M 2-2 and Factory Mutual Data Sheet 1-10?*

7. *In special cases, where it is deemed mandatory to use substantial quantities of wood, is its use approved by the Authority Having Jurisdiction? Is the wood pressure impregnated with an Underwriters Laboratory listed fire retardant material? (BMP)*

8. *Are materials such as highly combustible plastics being used with special precautions and approved by the Authority Having Jurisdiction? Is this material being used in nuclear facilities or in areas susceptible to smoke damage? (BMP)*

Reference Factory Mutual Data Sheet 1-57 can be utilized for additional guidance on the use of plastics. This would not apply to the use of foamed plastics below ground, enclosed by masonry, above roof decks when part of a Underwriters Laboratory or Factory Mutual approved assembly, part of Underwriters Laboratory or Factory Mutual approved "sandwich" wall construction, or foam core doors, if the core material is not exposed.

Objective **G. Fire Department - A fully staffed, trained, and equipped fire department/brigade shall service all DOE facilities, except as determined by the PSO. (Refer to the fire protection positions on minimal staffing levels in the DOE Fire Protection Resource Manual.) DOE or Contractor-operated organizations with the responsibility for providing fire protection for DOE property may enter into mutual aid agreements with other fire departments in accordance with Public Law 46 (Title 42 USC Section 1856). (DOE 5480.7A Paragraph 9 Section b(7))**

Criteria 1. *Do the emergency brigades receive periodic training in safe fire fighting techniques, location and use of fire fighting*

equipment, familiarity with facilities and their special hazards, first aid, rescue, and salvage as required by NFPA 600 2-3? Are there instructions for the line of authority to be followed in emergencies in accordance with NFPA 600 2-4?

2. *Is there documented records for compliance with NFPA 1500 for Fire Department organization?*

3. *Is there a training program for officers in accordance with NFPA 1021 1-3.1?*

4. *Is there a training program for fire apparatus driver/operators in accordance with NFPA 1002 2-1.1?*

5. *Is there a training program for inspectors, investigators and prevention officers in accordance with NFPA 1031?*

6. *Are the instructor personnel trained and experienced as required by NFPA 1201 8-3?*

7. *Do the records of the training program provide the necessary information to review and audit the training program as required by NFPA 1500 and 600?*

8. *Are regular physical fitness assurance tests required as specified by NFPA 1201 7-1.4.3?*

9. *Are minimum entrance physical and medical fitness requirements established and required of new Fire Department personnel in accordance with NFPA 1001 2-1?*

10. *Are multi-company drill exercises performed as required by NFPA 13E and NFPA 197?*

11. *Are adequate drill facilities available in accordance with NFPA 1402 Chapter 7?*

12. *Are drills performed under simulated smoke conditions with breathing apparatus as specified by NFPA 1402 9-1.3?*

13. *Are drill exercises ever performed in facilities other than the drill tower and training area?*

Objective **G1. Fire brigade and the required training is provided to these units when they exist or are used on site.**

Criteria *1. Is there a program for the training of personnel as required by NFPA 600 2-3?*

2. *Is there management support to keep the Fire Brigade at proper strength?*

3. *Is the Fire Brigade supplied with adequate and proper equipment in accordance with NFPA 600 2-6?*

4. *Are training facilities adequate as required by NFPA 1402?*

5. *Is adequate training time available as specified by NFPA 600 2-3.4?*

6. *Are outside training agencies and facilities utilized as well as outside expertise?*

7. *Have minimum physical requirements for the members been established in accordance with NFPA 1001 2-1.4?*

8. *Are periodic physical examinations of the members completed as required by NFPA 1201 7-1.4.3?*

Objective **H. Fire Protection Water Supply** (DOE 5480.7A Paragraph 9 Section b(8))

Criteria 1. *Do the water supplies have at least a two hour minimum stored water capacity as required by NFPA 13 7-1.1? Does it meet the flow and pressure requirements of the suppression systems? If municipal supplies are used, do they have the same capability as a dedicated water supply and are they acceptable to the Authority Having Jurisdiction?*

Reference A dedicated system needs to meet hose stream and sprinkler demands. A combined fire and process (domestic) system must be able to deliver the fire demand plus the maximum daily domestic demand for the required duration.

2. *Does the facility have a water main system adequate to supply both utilities and fire protection water? (BMP)*

3. *Does the yard system utilize a loop concept whenever possible with provisions for future expansion? (BMP)*

4. *Is there two-direction feed for each facility or buildings? (BMP)*

5. *Can utility pumps provide the needed utility water needs without resorting to the use of a fire pump? (BMP)*

6. *If well pumps are used as a fire water source, do they meet the requirements of NFPA 24 2-3 and Factory Mutual Data Sheet 3-7N?*

Objective **H1. Water capacities are sufficient to meet the demands.**

Criteria 1. *Does the required flow for the system include the total water*

demand as required by NFPA 13 5-2.3.1.1? Are utility and process water flows and fire hose and fire sprinkler demands included?

2. *Was a minimum of 500 gallons per minute included for the hose stream demand as specified in NFPA 13 Table 5-2.3?*

Objective **H2. The water storage tanks are adequate.**

Criteria 1. *Are the water storage tanks listed/approved or designed in accordance with NFPA 22?*

2. *Are the tank(s) sized for the highest estimated fire water demand (sprinklers plus hose streams) plus process and utility water demand? Is the demand duration based upon the tables utilized by Factory Mutual, Industrial Risks Insures, and NFPA Standards?*

3. *When values exceed $25 million, are dual or redundant water storage tanks provided? (BMP)*

Objective **H3. The installation, design and testing of the fire pump(s) give an adequate and reliable system.**

Criteria 1. *Are the fire pumps designed, installed, and tested in accordance with NFPA 20 Chapter 5 and Factory Mutual Data Sheet 3-7N?*

2. *Are the fire pump(s) protected from damage caused by fire or water flooding as required by NFPA 20 2-7? Are they housed in a separate non-combustible pump house away from other buildings and near the water storage tank as recommended by NFPA 20 A-2-7? When it is necessary for the pump room to be located inside one of the other plant buildings, is the room separated by fire walls and with fire doors as specified by NFPA 20 A-2-7?*

3. *Do the fire pumps start automatically on pressure drop to a predetermined point? Are utility or booster pumps being used to maintain pressure on the system ? Does the primary fire pump start within 10 psi of its rated pressure? Do the successive pumps start at 5 to 10 psi lower increments?*

4. *Are alarms provided to a constantly attended location such as the Fire Department as required by NFPA 72 7-2.1 AND 20 7-4.7?*

5. *Are the fire pumps sized to deliver the highest estimated fire water demand for both sprinklers and hose streams?*

6. *Do the fire pumps meet the normal requirements for reliability? Does one have an electric drive and the other have a diesel engine drive? Is each capable of providing the required fire water demand at the critical performance points specified in NFPA 20 5-*

1.2?

7. *Are the fire pumps, controllers,and related equipment Underwriters Laboratory listed and Factory Mutual approved as required by NFPA 20 5-2.1? Is a listed or approved test flow meter included and is it installed in accordance with NFPA 20 2-1.4?*

Objective **H4. Water distribution system is satisfactory.**

Criteria 1. *Are dedicated fire water storage and distribution systems being provided, wherever practical? If a dedicated fire water supply system are not provided, does the water system provide the the required fire protection water regardless of simultaneous process and domestic water usage?*

2. *Are combined systems provided with approved backflow prevention assemblies to preclude the introduction of pollutants?*

3. *Are mains a minimum of eight inch diameter as recommended by NFPA 24 7-5.2 and DOE Orders? Is the supply piping to individual fire sprinkler systems at least as large as the fire sprinkler system riser as specified by NFPA 13 7-1?*

4. *Does the installation of the fire mains, hydrants, and valves including flushing and testing conform to NFPA 24 8-8 AND 8-9?*

5. *Does the water distribution system provide two-way flow? Is sectional valving arranged to permit alternate water flow paths to any point in the system, whenever feasible as required by NFPA 24 3-4? Will a single impairment in the distribution system interrupt the water supply to any building lead-in?*

6. *Are sprinkler supply lead-ins at least 6 inches minimum? If four-inch lead-ins are used for small systems, have the required flows been substantiated by hydraulic calculations? (BMP)*

7. *Where combined fire and domestic (process) water systems are provided, are the supplies to each building arranged and valved so that the domestic (process) systems can be shut down without shutting off the fire system supply? (BMP)*

8. *Are the sprinkler system risers located at an exterior wall with the sprinkler supply lead-in runs under buildings kept to the minimum distance possible? (BMP)*

9. *Are key-operated buried valves being used for sprinkler control valves? If so, are they being replaced? (BMP)*

10. *Are control valves installed on each hydrant line near the hydrant, on each sprinkler system supply line just off the main*

loop, and sectional valves at strategic locations on the main loop as required by NFPA 24 3-2.1? Are the number and location of sectional control valves such that various sections of the fire water loop can be isolated without shutting off the entire loop as specified by NFPA 24 3-5.1? Are the valves located at the height necessary for ease of operation and to preclude obstruction from snow and ice as noted in NFPA 24 3-2.6?

11. *Are underground control valves for fire water systems, combined fire and service water systems, and fire sprinkler systems equipped with Underwriters Laboratory listed or Factory Mutual approved indicating vales such as Post Indicator Valves or Butterfly Post Indicator Valve Assemblies as required by NFPA 13 4-5.1.1.1?*

12. *Do the sectional control valves have supervisory alarm switches as specified in NFPA 13 4-5.1.1.3?*
13. *Are fire hydrants placed at strategic locations around each facility such that hydrants are not more than 300 feet apart and each facility or building has no less than two hydrants located within a 300 foot hose lay as recommended by NFPA 24 4-2.1?*

Objective **I. Underground Piping** (DOE 5480.7A Paragraph 9 Section b(9))

Criteria 1. *Are mains a minimum of eight inch diameter as recommended by NFPA 24 7-5.2? Is the supply piping to individual fire sprinkler systems at least as large as the fire sprinkler system riser as specified by NFPA 13 7-1?*

2. *Are the fire hydrants of the proper type for weather conditions expected and are they listed and approved as specified by NFPA 24 4-1.1?*

3. *Are the fire hydrants strategically located around the facility at distances normally not greater than 300 feet as required by NFPA 24 4-2.1? Are the fire hydrants located about 50 feet from buildings in accordance with NFPA 24 4-2.2? Are the fire hydrants located within a reasonable working distance from the shoulder of the road?*

Objective **J. Liquid Run-off Control** (DOE 5480.7A Paragraph 9 Section b(10))

Criteria 1. *Is there a system in place to achieve liquid run-off control? (BMP)*
2. *Have natural or artificial means of controlling liquid run-offs from a credible fire been provided? (BMP)*

3. *Are contaminated or polluting liquids contained and not allowed to escape the site including potently contaminated water resulting from fire fighting operations? (BMP)*

4. *Is the amount of fire water that must be controlled and the design of the containment system in accordance with HQ and Field Office guidance? (BMP)*

Objective **K. Fire Alarm Systems** (DOE 5480.7A Paragraph 9 Section b(11))

Criteria 1. *Are the alarm system components and equipment listed and/or approved for the intended use as specified by NFPA 72 2-1.3? Are the supervisory systems provided to monitor the status of alarm or suppression system components as recommended by NFPA 72 1-4?*

2. *Does the routing of fire alarm and detection control system wiring use a philosophy which avoids a "common failure mode" potential by routing cable away from high hazard areas, or the same zones as this equipment is to protect?*

3. *Where possible, are fire alarm control panels located to provide access in an emergency in accordance with NFPA 101 7-6.6.1?*

4. *Are the fire alarm control panels locked to prevent unauthorized access and keys restricted to appropriate personnel?*

5. *Does the activation of an alarm signal result in the initiation of a method for summoning area Fire Department and/or Fire Brigades as required by NFPA 72 6-5.3?*

Objective **K1. Supervisory alarms are satisfactory.**

Criteria 1. *Are provisions made for supervising the status of all fire protection systems including a different alarm for trouble and supervisory signals as required by NFPA 72 3-4.2.?*

Reference These alarms are needed on, but not necessarily limited to, cabinet tamper, fire system control valves, pressure in dry pipe systems, low nitrogen pressure in dry pilot detection systems or supervised preaction systems, low water level and temperature on water storage tanks, fire pump running, auto position of fire pump controller, fire pump controller trouble, dry valve enclosure temperature, fire detection system trouble, and special extinguishing system trouble.

2. *Are all control valves supervised in accordance with NFPA 72 3-4.2.5? Does this include all valves which control flow to heads in a sprinkler system and include control valves for subsystems such as preaction and antifreeze systems?*

Objective **K2. Fire detection systems are satisfactory for the intended use.**

Criteria 1. *Are the fire detection systems provided as required by DOE Orders,*

Field Office, or Operating Contractor Fire Protection Engineer? (BMP)

Reference — Detection alone may be provided in facilities of low value or importance. However, detection is not a substitute for required fire suppression system. Normally, detection will be specified when an early alarm is needed due to life hazard or in areas housing high value electrical and/or electronic equipment where the detection is provided in addition to suppression.

2. *Are heat actuated detectors (fixed temperature, rate of rise, rate compensated, or combinations) used in areas housing ordinary combustible material in accordance with NFPA 72E Chapter 3?*

3. *Are flame actuated detectors used when rapid detection is of prime importance in high hazard areas, such as fuel loading platforms, industrial process areas, hyperbolic chambers, high ceiling areas, or atmospheres where explosions or very rapid fires may occur as required by NFPA 72E 3-2?*

4. *Are smoke detectors used where slowly developing or smoldering fires are likely to occur in accordance with NFPA 72E Chapter 4?*

5. *Are photoelectric smoke detectors used in areas where high concentrations of smoke (visible smoke) are apt to be produced by a fire as recommended by NFPA 72E 4-2.2 AND 4-2.3?*

6. *Are all fire detection devices listed and/or approved? Are the detectors installed in accordance with NFPA 72E 2-7 with spacing in accordance with their listing and/or approval? Are the detectors compatible with the fire alarm control panel?*

7. *Are detectors that activate a special extinguishing system, such as Halon 1301 or carbon dioxide, cross zoned as required?*

8. *Are manual fire alarm pull boxes provided as required by NFPA 101 7-6.2, NFPA 72 3-2, and 10 CFR 1960?*

Objective **L. Containment Systems for Ventilation** (DOE 5480.7A Paragraph 9 Section b(12))

Criteria 1. *Are process tanks vented in accordance with Factory Mutual Data Sheet 1-25?*

2. *Have the vents for flammable and combustible liquids tanks been evaluated for adequacy as required by NFPA 30 2-4.5.1?*

3. *Are the vents rated at one cubic feet per hour of free air for every cubic feet per hour of fill or discharge rate?*

4. *Are vents protected from freezing or blockage by weather as recommended by NFPA 30 2-3.4.7?*

5. *Are closed tanks equipped with vacuum breakers or pressure relief devices as specified by NFPA 30 2-3.4.6?*

6. *Are vents screened? If so, is the screened area three times vent area as required by Factory Mutual Data Sheet 1-25?*

Objective **M. Special Hazard Protection** (DOE 5480.7A Paragraph 9 Section b(13))

Criteria 1. *Is a high standard of housekeeping being maintained in all facilities? (BMP)*

2. *Is there a program for the collection and disposal of combustible waste and rubbish on a daily basis? (BMP)*

3. *As far as practicable are rags, packing, and similar combustible materials being stored in noncombustible containers and protected by automatic devices for controlling and extinguishing fires involving such materials? Are clean and used rags and waste being stored separately in covered metal containers? (BMP)*

4. *Are areas within 15 feet of buildings being used for storage of combustible material? Are these areas being kept free from accumulation of debris and combustible vegetation? (BMP)*

Objective **N. Halon Usage** (DOE 5480.7A Paragraph 9 Section b(14))

Criteria 1. *Has a program been instituted to meet the objective of the DOE Memorandum by EH-31.3 "Managed Phase Out of HALON Fixed Fire Suppression Systems" dated May 5, 1993.*

2. *Is the program up to date? (BMP)*

Objective **O. Seismic Criteria** (DOE 5480.7A Paragraph 9 Section b(15))

Criteria 1. *Is the fire protection systems designed to withstand a seismic event in accordance with the criteria developed by the NFPA 13 4-5.4.3.3, DOE 6430.1A and University of California Lawrence Radiation Laboratory (UCRL) 15910 requirements?*

Objective **P. Impairment Control** (DOE 5480.7A Paragraph 9 Section b(16))

Criteria 1. *Is a fire protection impairment control system used meet the Improved Risk and NFPA guidelines?*

2. *Where values and/or hazards are unusually high, have special measures been taken to reduce the fire risk? (BMP)*

3. *Is management accountable for maintaining fire prevention and protection of facilities during an impairment? (BMP)*

4. *Is watchman service (generally in accordance with NFPA 601 chapter 3) being provided during times of impairments?*

Objective **Q. Higher Standard of Protection** (DOE 5480.7A Paragraph 9 Section b(17)) **This section includes items that are used to evaluate if a site and or facility are providing protection that meets a higher standard of fire protection.**

Q1. Heating appliances are satisfactory.

Criteria 1. *Are heat producing devices being used in accordance with manufacturer's recommendation for required separation distances? (BMP)*

2. *Are the heat producing devices being used approved for the service intended by a nationally recognized testing laboratory? (BMP)*

Objective **Q2. Melting kettles or pots are not a uncontrolled fire hazard to the building.**

Criteria 1. *Are fire extinguishers provided at locations where heating or melting kettles are used or hot substances are applied? (BMP)*

2. *Are heating or melting kettles or pots mechanically stable and appropriate barriers provided so as to be isolated from pedestrian and vehicle traffic? (BMP)*

3. *Has proper protective equipment and clothing been provided for all persons handling hot substances? (BMP)*

Objective **Q3. Space heaters when used are satisfactory.**

Criteria 1. *Are oil and gas fired space heaters that are used for occupied area of the "indirect-fired" type? If direct fired units or ones that do not discharge combustion gasses are used, has a monitoring program for toxic gasses been established? (BMP)*

2. *Are portable gas fired heaters located outside of buildings with heated air ducted into the point of use? (BMP)*

3. *Are open fires or fires in open end drums prohibited? (BMP)*

Objective **Q4. Heater fuel supply and storage are satisfactory.**

Criteria 1. *Are oil or liquified petroleum gas (LPG) fuel supplies for heaters installed or properly contained outside of buildings or enclosures with fuel lines protected against mechanical damage? (BMP)*

2. *Are LPG supply tanks of less than 125 gallons (aggregate cylinder*

content) located outside of the building? Are larger supply tanks installed in accordance with NFPA 58 2-2.2?

3. *Where fuel supply tank are an integral part of the heating unit, are the units listed or approved and is the installation and use in accordance with that listing and/or approval? (BMP)*

Objective **Q5. Tarpaulins, plastic materials and temporary structures are constructed and used in a satisfactory manner.**

Criteria 1. *Are all tarpaulins or cover cloths for in building use flame retardant and passed the testing in accordance with the large scale fire test of NFPA 701 Chapter 7 as required by NFPA 241 2-2.1?*

2. *Are only noncombustible materials being used in the construction of temporary structures within buildings as required by NFPA 241 2-1.1? If plywood and similar materials are used, are the materials fire retardant treated and have a flame spread rating of 25 or less?*

Objective **Q6. Welding, cutting, and other hot work is done in satisfactory manner.**

Criteria 1. *Is welding, cutting, and other hot work outside designated shop areas controlled by a permit system?*

2. *Does the hot work permit system meet the NFPA 51 and the Improved Risk requirements?*

Objective **Q7 Disposal of waste, scrap, and hazardous wastes done in a satisfactory manner.**

Criteria 1. *Are separate provisions provided for the collection and disposal of corrosive, toxic, radioactive, explosive, flammable materials, and waste individually? (BMP)*

2. *Is hazardous waste stored in approved "90 day storage facilities" or "satellite storage" and do they meet the requirements of NFPA 30, Uniform Building Code, and 29 CFR 1910.106?*

3. *Are the drums and portable containers of flammable waste bonded and grounded and labeled to indicate the contents hazard classification in accordance with NFPA 325M 1-5.5?*

Objective **Q8. Storage arrangement are satisfactory and in accordance with the related codes and standards.**

Criteria 1. *Is shelving securely fastened to prevent falling or tipping? Are shelving dimensions as specified by NFPA 231C Chapter 4?*

2. *Is the vertical clearance from overhead sprinkler heads at least 18 inches for shelf storage and 3 feet for palletized or pile storage over 12 feet and rack storage regardless of height as required by NFPA 231C 4-5? Is adequate clearance provided for fire doors, extinguishers, fire alarm cabinets, manual fire alarms, sprinkler valves, and risers to permit their proper operation and testing in accordance with NFPA 231C 4-4?*

3. *Are non-electric vehicles restricted from being parked or stored inside storage or warehouse facilities? (BMP)*

Objective **Q9. Flammable and combustible liquids are used, stored, and handled in an acceptable manner.**

Criteria 1. *Does the use, storage, and handling of flammable and combustible liquids meet the requirements of NFPA 30 4-6.1 and Factory Mutual Data Sheet 7-29?*

2. *Is spray painting done in accordance with Factory Mutual Data sheet 7-29, NFPA 33 Chapter 3, and 29 CFR 1910.101?*

3. *Is the use of flammable liquids for shop, bench, and laboratory usage restricted to the minimum reasonable quantities, generally a one day supply? (BMP)*

4. *Are all portable dispensing flammable liquid containers listed and/or approved? (BMP)*

5. *When flammable liquids are used in unusual circumstances, is a "Safe Work Permit" or other documented control system used to assure prevention of dangerous mixtures and to establish safe working conditions? (BMP)*

6. *Are flammable or combustible liquids or combinations of substances that may form explosive mixtures kept from discharging into the sewer systems? (BMP)*

7. *Are all fixed and portable lines, storage tanks, and other equipment used in handling flammable and combustible liquids bonded and grounded in accordance with the NFPA 30 and 29 CFR 1910.106?*

Objective **Q10. Outside storage and use of flammables is done in a satisfactory manner.**

Criteria 1. *Are tanks such as those used for servicing vehicles, fuel storage for building heating systems, fuel storage for internal combustion engines, and similar tanks located in accordance with NFPA 30 4-6 and other required Codes and Standards?*

2. *Are aboveground tanks being used for bulk storage of flammable liquids constructed, located, diked, and provided with suitable fire fighting equipment in accordance with NFPA 30 4-7, NFPA 31 2-6.5 and NFPA 11 3-1.6? Do the dikes contain 125% of the spill of the largest tank plus at least 20 minutes of fire suppression discharge as required by NFPA 59 3-4.4 AND 3-4.4.1?*

3. *Are cylinders of flammable gas located outside and at a safe distance from the building, against a blank fire resistive wall, or "other equivalent method" and segregated from oxygen cylinders as required by the NFPA 30 4-8?*

Objective **Q11. Electrical Equipment used in areas with flammable liquids is satisfactory.**

Criteria 1. *Is electrical equipment, wiring, and fixtures located or used in areas in which flammable liquids are stored, used, or handled, listed and/or approved as required by NFPA 30 4-4.1.5?*

2. *Are electrical inspection, testing, and maintenance programs being conducted at a frequency sufficient to ensure that ignition of flammable vapor or dust by electrical causes will be minimized as recommended by NFPA 70B 4-4.5, 5-2, AND 18-4?*

3. *Are details of grounding requirements for portable tools and extension cords used in locations where flammable vapors may exist in accordance with NFPA 37?*

Objective **Q12. Hazardous materials (for purposes of this section are ones which meet the definition of "hazardous chemical" by NFPA 49 Chapter 1) are handled, stored, and used in a satisfactory manner.**

Criteria 1. *Is consideration given to the compatibility of chemicals in storage areas? Are materials identified by type and segregated by risk? In large storage facilities, are specific areas identified and barriers provide to assure adequate separation? (BMP)*

2. *Are the floors provided with adequate slope to scuppers or drains to permit cleaning and spill control? Are curbs and secondary containment provided when required by Codes or Standards? (BMP)*

3. *Are the hazardous materials stacked or piled only in accordance with the Safety Analysis Report or thorough engineering evaluation? Does this consider the effects and hazards posed by fire, seismic events, etc? (BMP)*

4. *Is there a program including procedures to provide control in the use and handling of hazardous materials? Does the program require*

review by the Fire Protection Engineering staff of the procurement of hazardous materials? (BMP)

Objective **Q13. Gas and oil fired equipment such as boilers, furnaces, etc are provided with the proper combustion safe guards and are not an unprotected fire hazard.**

Criteria *1. Are fixed boilers, fixed heaters, etc. provided with full complement of combustion controls as required by the Improved Risk criteria?*

2. Are the following items provided on all units greater than 400,000 btu in addition to the NFPA 85 and 86A items:

a. Listed and/or approved flame supervision controls for the pilot and the main burner.

b. Pre-ignition purging for at least four air changes on all boilers,

c. Time trial for ignition limited to 10 seconds for gas fired units, 10 seconds for number 1 through 4 fuel oils, and 15 seconds for numbers 5 and 6 fuel oils,

d. Fuel supervision switches for oil systems, low oil pressure and temperature switches; and high for gas systems, and low gas pressure?

Reference Temperature supervision is not needed for unheated oils.

e. Forced and induced fans supervised (both air flow switches and motor starter interlocks) to ensure proper airflow,

f. Modulating control and interlocks to assure low fire start with air dampers at maximum open during purge and start-up,

g. Fuel oil strainers, heaters, filters, water separators, etc.

h. Listed and/or approved safety shut-off valves interlocked with the safety circuit in addition to the operating control valves,

i. Low pressure supervisory switch for atomizing air or steam for oil fired boilers

j. Recirculating bypass with low and excess temperature cut-outs provided on the oil heated systems,

k. Emergency manual fuel shut-off valves located outside the boiler area.

Objective **Q14. Transformers with combustible liquid used as an insulating medium are adequately protected.**

Criteria *1. Are transformers located and protected as required by the National Electrical Code and Factory Mutual Data Sheet 5-4?*

2. If used, are fire barriers designed to meet the requirements of Factory Mutual Data Sheet 5-4?

3. Where continuity of service is essential (such as reactors, critical processes, etc), are transformers over 500 kva separated from each other by 50 ft, have fire barrier walls between transformers, or be protected by a automatic fire suppression system? (BMP)

4. Are inside transformer vaults rated at 3 hour fire resistive construction with drainage of the combustible liquids to a safe location provided? (BMP)

5. Is the fire protection for transformers installed in vaults as required in Factory Mutual Data Sheet 5-4?

Objective **Q15. Switch yards are provided with required fire protection features.**

Criteria *1. Are switch yards, transformer yards, substations, and similar areas fenced with a minimum 6 foot high chain link fence with sealed or locked gates? (BMP)*

2. Are transformer yards filled to a depth of 4 inches with 3/4-inch maximum crushed gravel or coarse crushed stone? Is the grading such that drainage will be to a safe location away from buildings and equipment? Is curbing provided, if necessary, to accomplish this? Does the drainage area have sufficient volume to hold all of the liquid from the largest transformer in addition to the contents discharged from any installed extinguishing system during a 20-minute discharge? (BMP)

Objective **Q16. Cables in the control rooms are installed in the proper manner.**

Criteria *1. Are cables in control room panels provided with as much separation as possible between cables of different types; ie, power cables and signal cables, power limited circuit (Class II and III) cables and other signal cables, power cables of less than 480 V nominal and those of higher than 480 V nominal, ac and dc cables, 60 Hz and higher frequency cables, etc? Does the wire and cable installation comply with the requirements of the National Electrical Code and Factory Mutual Data Sheets?*

2. *Are redundant cables in reactor and non-nuclear plant control panels adequately separated or provided with approved fire barriers as required by ANSI 384 and/or the applicable Nuclear Regulatory guidance?*

3. *Are only conductors in metallic conduit raceway systems permitted below raised floors or above suspended ceilings of reactor control rooms? (BMP)*

4. *Are multi-conductor cables listed and/or approved and meet the flame test requirements of IEEE 383 or Factory Mutual Group 1?*

Objective **Q17. Electrical cable tray installations are installed in a satisfactory manner related to fire protection requirements.**

Criteria 1. *Are cable trays installed with a 24-inch minimum clearance between trays? (BMP)*

2. *Does the cable insulation meet the requirements of National Electrical Code and Factory Mutual?*

3. *Where cable or raceway systems penetrate fire walls, floors, or ceilings, are fire stops or fire seals of a fire resistant rating equivalent to the rating of the wall installed? Are the materials used a tested configuration and listed and/or approved for this use? Are conduits passing through a fire barrier provided with interior fire stops or fire seals in accordance with a tested configuration? (BMP)*

Objective **Q18. Battery rooms are satisfactory.**

Criteria 1. *Are non-sealed cell batteries located in rooms separated from the rest of the building by noncombustible walls or fire rated walls when the fire exposure to or from other building occupancies warrants fire rated construction? Does the ventilation, wiring, and equipment comply with the requirements of the National Electrical Code?*

2. *Are unsealed, off-gassing types of batteries separated from sensitive electronic or relaying equipment to avoid corrosion of the equipment?*

3. *Does the design ensure that hydrogen concentration not exceed 10% of the lower explosive limit (LEL)? Where forced ventilation is required to ensure explosive gas concentrations remain below 10% of the LEL, will the loss of forced ventilation cause an alarm in a continuously occupied area, or shut down the charging current to the batteries?*

Objective **Q19. Switch gear rooms are satisfactory.**

Criteria *1. Are two exits provided for switch gear rooms? Are the switching equipment rooms separated from the remainder of the facility by fire rated construction as required by Codes?*

2. Are these rooms provided with smoke detection for rapid discovery of fire? (BMP)

3. Are combustibles other than insulation on wiring kept out of these rooms? (BMP)

4. Are automatic sprinklers provided in these rooms in accordance with DOE Orders, Codes and Standards? (BMP)

Objective **Q20. Fire prevention and protection of high efficiency particle air (HEPA) filters is satisfactory.**

Criteria *1. Are air or inert gas filtration systems provided for each ventilated glove box or process cell? Does the air stream pass through at least one fire resistant HEPA filter? Is the discharge through at least one fire resistant pre-filter and one fire resistant HEPA filter? Are these units located in the exhaust duct work leading to a final filter system? In cases of plutonium contaminants are two or more fire resistant HEPA filters used in the glove box or process cell exhaust system? Is each plutonium contaminant filter system equipped with a temperature and pressure gauge? (BMP)*

2. Is the ventilation system designed to withstand a credible fire or explosion and continue to act as a confinement barrier? Do the fire protection features of ventilation systems include fire resistant materials for construction, fire resistant filters, heat and smoke detectors, alarms, heat removal devices, fire suppression equipment, and fire doors and dampers or other proven devices to restrict the spread of fires? (BMP)

3. Does the design of the system include an analysis to ensure that the ventilation system is capable of operating under design basis fire conditions? Does the design allow to the maximum extent possible, the withdraw of heat and smoke through appropriate ventilation channels so that products of combustion are not spread beyond the room of origin? (BMP)

4. Where HEPA filtration systems serve as a final means of effluent cleaning, are there at least two stages of fire resistant filters in series? If it can be determined that the filters are subjected to sufficient heat to cause failure, are the final filters protected by heat removal or an automatic sprinkler systems? (BMP)

5. *If a heat removal system is deemed necessary, are inlet baffle and spark arrester and demister provided prior to the first stage of filters? If a cooling spray is used for heat removal, does it have a combination spark arrester-demister screen to remove entrained droplets? Is a roughing filter mounted behind these components to remove the bulk of the draft carried debris? Are the contaminated filters easy to remove? (BMP)*

6. *Does the cooling spray system operate automatically upon abnormal heat rise indicated by detectors in the exhaust ducts feeding the cool chamber inlet? Are manually operated valves actuating the spray system provided as a backup? Does the drain system prevent an accumulation of liquid in the plenum? Are the collection tanks a critically safe configuration and are they routed to the service waste or other contaminated drain system? (BMP)*

SECTION IX
Fire Protection Program Assessment Report

The Report generated by this Assessment will be either the Base Assessment or a Follow-up to a Base Assessment. The Base Assessment is the most in-depth review of the Fire Protection Program, most important and most thorough overall inspection and report. A Follow-up Assessment will update the Base Assessment Report as required. This report will note changes in the Fire Protection Program, facility, or related areas. Strengths and weaknesses of the Program are to be included. Program weakness will be expressed as concerns. These concerns are to be rated or identify to the level of risk involved and the impact of a loss. The Report generated from this assessment may cover any of the following:

A. Operation, Field, and/or Area Office assessment.

B. A Site wide assessment.

C. A site assessment covering only selected facilities.

D. A site assessment covering only selected buildings.

The Report for these Assessments will take several different forms. The Report of a Operations, Field, or Area Office (A above) will be a narrative type report covering what was done, when it was done, why it was done and the results with areas of concerns included.

The Assessments and Reports for B, C, and D will need to (a) Evaluations of unusual loss potentials and/or hazards, (b) Anticipate, identify, evaluate, and describe existing loss potential hazards, particularly those which could produce losses in excess of DOE 5480.7A guidelines, and (c) Present recommendations and provide details. The Report needs to be as brief as possible and yet concisely cover all important areas.

OUTLINE OF THE BASE ASSESSMENT REPORT

The Text of the Base Report for B, C, and D shall follow the outline below. For large sites with many large buildings it is permissible to group major headings by building. The Report will included the following headings:

1.0 INTRODUCTION AND FACILITIES DESCRIPTION

1.1 Description of facilities, its function, and related fire hazards

1.1.1 Describe serious hazards which are present.

1.1.2 Concisely describe hazardous occupancies such as flammable liquid dipping, spraying, impregnating, coating, magnesium

working, gas manufacture, or combustible dust producing occupancies and the safeguards provided to minimize a loss potential.

1.1.3 Describe the quantity, type, (petroleum, alcohol, or water base) and location of the warehouse type storage of pressurized aerosol-type containers.

1.2 Description of building construction and occupancy

1.2.1 Construction features which are not readily apparent on the sketch need to be covered in the report text. This would include unusual construction and deviations from standard types. (For example: hyperbolic designs, cable supported

1.2.2 The following items may represent problem areas and need to be covered in the report, if present:

a. Class I and/or Class II roofing components,

b. The susceptibility of building roofs and other structures to collapse due to weak construction, overloading, or pounding, dust or vapor explosion hazards,

c. Loss limiting fire walls and/or space separations when required by DOE 5480.7A and 6430.1A (roofs, exterior supporting framework, etc.)

d. Any extensive use of plastic for construction materials,

e. Large signs, cranes, superstructures, cooling towers etc. which have loss potentials from wind storm damage over the DOE 5480.7A limits.

1.2.3 Provide a brief and concise summary description of the major areas of rack, solid, and palletized storage. Include commodity class, overall storage height, number of tiers, aisle widths, depth of racks, flue spaces, type of pallets, type of racks, type of storage container, physical form of material, and type of array.

1.2.4 Cover yard storage of significant values and hazards. Give details of storage arrangement, width of aisles, size and height of piling, clearance from buildings, yard fencing, hydrant protection, and housekeeping. Exposures are most commonly consist of fire or explosion in adjacent facilities.

1.2.5 Include details of other exposures, such as falling aircraft from nearby airports.

1.3 Description of planned modifications or fire protection upgrades

1.3.1 It is desirable to explain conditions that require automatic sprinklers or to provide details for other recommendations.

1.3.1 Give a time table for the expected completion and close out of the concerns generated as part of this assessment.

2.0 LIFE SAFETY CONSIDERATIONS

2.1 Description of exit systems

2.2 Analysis of the adequacy of the exit system

2.3 Description and analysis of emergency lighting and exit signs

3.0 FIRE PROTECTION OF FACILITIES EQUIPMENT

3.1 Description and analysis of safety class systems protection

3.2 Description and analysis of vital programs protection

3.3 Description and analysis of high value property protection

3.4 Description and analysis of fire protection of vital programs

4.0 FIRE SUPPRESSION EQUIPMENT

4.1 Description of fire suppression equipment

4.1.1 Describe any special fire protection systems, such as water spray, open sprinklers, and permanently piped foam, carbon dioxide, dry chemical, halon or steam.

4.1.2 Provide information for unusual fire protection system designs, such as girded dry systems, dual systems, etc.

4.2 Description of fire alarm and detection equipment

4.2.1 The fire alarm and detection systems shall be evaluated as the type, coverage, approvals, and related information.

4.2.2 Include an evaluation of the acceptability of the system to provide the required alarm and detection functions.

4.3 Analysis of the adequacy of equipment

4.3.1 Use this section to cover conditions and protection details which are not evident on the sketch or in other parts of this Report. Describe the sprinkler installations over high water demand occupancies (i.e., warehousing, flammable liquids, hydraulic systems, etc.).

4.3.2 Describe the water system used to supply the fire protection systems. To be credited as a water supply to sprinklers, fire and booster pumps must he arranged for automatic starting using listed and approved equipment that is well maintained and tested.

4.3.3 For locations in UBC Earthquake Zone 2 or 3, include descriptions of the Earthquake Protection for the sprinkler and water supply systems.

4.3.4 An analysis of the water system(s) is needed to show its adequacy for fire fighting purposes. This would include the ability to supply water under fire conditions for both automatic suppression systems and manual fire fighting.

4.3.5 Additionally, the report shall evaluate the water supply's capability of meeting the requirements for dual sources, earthquakes protection, and related requirements as noted in DOE 6430.1A.

5.0 FIRE BARRIER INTEGRITY

5.1 Description and analysis of fire barriers

5.2 Description and analysis of the fire barrier testing

5.3 Description and analysis of the fire barrier maintenance

6.0 PROGRAM DOCUMENTATION

6.1 Description and analysis of pre-fire plans

6.2 Description and analysis of FHA

6.3 Description and analysis of MPFL/MCFL determinations

6.4 Review of facilities appraisal reports

6.5 Review of temporary procedures and interim compensatory measures

6.6 Status of findings from previous assessments

6.7 Description and analysis of administrative controls

6.8 Fire protection engineering staff; number, qualifications, training

6.9 Management support.

7.0 FIRE DEPARTMENT

7.1 Fire apparatus accessibility

7.1.1 The susceptibility of fire protection equipment to an impairment during a flood needs to be noted.

7.1.2 If there is a potential flood hazard, report the following: previous experience and maximum flood levels, buildings subject to flooding, effect on fire protection equipment, possible isolation of site, and loss of water and fire department service.

7.2 Description and analysis of fire training

7.3 Run off of fire fighting water

7.3.1 When fire protection water or other liquid damage is a concern, provide complete details in the report.

7.3.2 Include an evaluation of the system to limit the spread of water due to fire fighting activities.

7.4 Fire suppression organization (personnel and training).

7.4.1 The Fire Department and/or Fire brigade shall be evaluated to their size, training, responsibilities, and alarm response capabilities.

7.5 Fire suppression mutual aid agreements.

8.0 OPERATIONS AND MAINTENANCE

8.1 Review and analysis of inspection and testing procedures and Reports

8.2 Review and analysis of maintenance procedures

8.3 Review and analysis of corrective action and work order priority

9.0 IDENTIFIED DEFICIENCIES

9.1 Deficiencies related to DOE Orders

9.2 Deficiencies related to NFPA Standards

9.3 Deficiencies related to other codes

9.4 Exemptions and documented equivalencies.

10.0 RECOMMENDATIONS

The method to correct the noted concerns must make sense to the final users of the Report. The most practical and economical answer with viable alternates, when possible, must be presented for each problem or concern and need to contain the following:

10.1 WHAT THE PROBLEM IS,

10.2 WHERE THE PROBLEM WAS NOTED,

10.3 WHY IT IS A PROBLEM,

10.4 WHEN ACTION IS NEEDED,

10.5 HOW THE PROBLEM MAY BE CORRECTED, and

10.6 THE LOSS POTENTIALS.

Loss potential are to be expressed in terms of Dollar at Risk, Cost for Clean-up, Cost for Extinguishment, Salvage, and Effect on the DOE Mission.

11.0 FIRE PROTECTION SUMMARY

11.1 Comprehensiveness of the Fire Protection Program

11.2 Rating of the Fire Protection Program at this site with the ideal Program for the Improved Risk

11.0 SKETCH.

Reference

The sketch needs to show fire protection features such as water mains used for fire protection, including the source (ie. fire pumps). The sketch shall include building plan view outlines, and sections. Areas not provided with automatic suppression system shall be identified. Fire exposures to the building such as transformers or yard storage shall be shown. Details used in developing the sketch shall be based on NFPA 170. Construction, occupancy,

and fire protection features of major buildings shall be included. Additionally, needed and/or required fire walls shall be noted. Fire walls shall be shown on both section and plan views. Materials available at the site or facility should be used in the making of the sketch. At a minimum the sketch should contain the following. A site plan showing the building or buildings that were assessed as they relate to the rest of the site, when only part of the facility is assessed. Additionally water mains, suppression system such as automatic sprinkler risers are to be noted along with the building(s) noted in plan and section. Some of the this information can be found on pre-fire plans or other related type drawings. The inclusion of a pre-fire plan is acceptable if it contains the needed data. It is acceptable to used a tiered approach in providing the data. Also required in this sketch is yard exposures or other buildings in the area.

FOLLOW-UP ASSESSMENT

Follow-up Assessments will note changes made since the last Base or Full Assessment, their effect on the mission, and any new concerns. Additionally, action taken to correct previous concerns should be noted and if the action taken was adequate to eliminate that concern. Concerns that were not corrected need to be re-evaluated, statuses, and reported again if they still are valid. Planned action to correct the concerns is needed along with expected completion dates. Follow-up Report will be updated as required. It will follow the same format as the Base Assessment. Comments are needed for any heading that had a prevoius concern noted. Areas that have been corected shall be so noted.