

Hazard Analysis	TAN BUILDING 603 FIRE SAFETY ASSESSMENT	Identifier: HAD-57
TAN Operations		Revision: 1
Document Control Center: (208) 526-6076	Document Owner/Approver: TAN ESH&QA Manager	Page: 1 of 9
		Effective Date: 10/30/00

Manual: Fire Hazard Analysis
for TAN Buildings

Change Number: 68367

1. INTRODUCTION

1.1. Purpose and Approach

This report documents the Fire Safety Assessment (FSA) for Test Area North (TAN) Building 603 at the Idaho National Engineering and Environmental Laboratory (INEEL). This Assessment reviews fire hazards, life safety features, and fire protection features of the building and verifies compliance to the Company and Site Fire Protection Program (FPP).

1.2. Facility Use, Function, and Occupancy

The primary function of TAN-603 is as a boiler house. The building also houses a 1st aid station, bunkhouse, and vehicle maintenance facility.

1.3. General and Site Fire Protection

TAN-603 is located in Technical Support Facility (TSF) area. The water supply is from the TAN distribution system consisting of a looped underground distribution system fed by three independent fire pumps and one water tank feed by the TAN deep well system. The water supply for the building is provided through a six-inch, ductile iron, water main which connects to the ten inch circulation main. Piping installed throughout the building is schedule 40 steel. A hose allotment of 500 gpm is included at the point where the fire hydrant connects to the underground fire main. The fire alarm system is tied to the Idaho National Engineering and Environmental Laboratory (INEEL) Fire Alarm System, monitored at Central Facilities Area (CFA). The fire alarm panel that provides alarms from building TAN 603 is located in TAN 601. This alarm system is known as Multiplex Interface Panel (MIP) Three. This fire alarm control panel supervises the water flow from the wet pipe automatic fire sprinkler system and the gate valve supervisory switch. The INEEL Fire Department provides the manual fire suppression capability for the building. The TAN fire station has a single engine company and is located on Nile Boulevard outside the perimeter security fence. This facility provides the initial emergency response to the TAN area. Fire fighters can respond from the station to the TAN buildings within ten minutes. Due to the distance from the second-in company, the Fire Department is aided by an Incident Response Team (IRT), consisting of trained members from both Specific Manufacturing Corporation (SMC) and TAN Operations. These individuals provide emergency support to the responding INEEL Fire Department. This level of protection is adequate for this facility.

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2. CONSTRUCTION

2.2. Description of the Facility

TAN-603 is a one story building approximately 9,700 sq. ft. containing a 1st aid station, driver sleeping area, a vehicle repair shop and a boiler room. This building is a mixed use building that contains business, residential and industrial occupancies as classified by NFPA 101 life safety code. The building is made up of the following construction.

The roof is a built-up roof on metal decking on bar joist anchored to masonry walls. The driver sleeping area has a sub roof of 2x6 wood joist with a tile ceiling.

The boiler room is separated by 8" CMU wall with a 1-1/2 hr., self-closing door. The majority of the remainder of the facility is made up of gypsum board on wood studs and is considered a type V construction in accordance with NFPA 220.

Interior finish is primarily painted gypsum board, masonry and 2x4 mineral ceiling tile which is considered as having a flame spread rating of less than 25 (Class A).

The floor is reinforced concrete on earth.

This building was not designed to UBC requirements.

2.3. Fire Boundaries

The building has no fire boundaries and is considered a single fire area. This building has a boiler area separated and the rest of the building by a 8" block wall.

3. LIFE SAFETY

3.1. Means of Egress

TAN-603 is a sprinklered, industrial occupancy, for which the LSC allows a 200' travel distance, with a maximum common path of travel of 50' and a maximum dead end limit of 50'.

There are six exits from the building. The Life Safe Parameters study conducted in 1993 indicates that this building is in compliance with NFPA 101. Factors evaluated during this study included exits, exit illuminations, fire sprinklers, fire alarm systems, building construction, fire separations, emergency organization and installed fire protection features.

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3.2. Emergency Lighting and Exit Signs

All egress routes are clearly marked with illuminated exit signs passage way are provided with emergency lights. The signs and lights are inspected, tested and maintained in accordance with PRD-158, "Inspection, Testing, and Maintenance of Fire Protection Systems and Equipment".

4. Fire Hazards

4.1 Significant Fire Hazards

TAN-603 contains switchgear boilers, and power distribution equipment Room 101, 101A. Room 105 is a vehicle service area, Room 109, 114A is used for bus drivers and 114 is the 1st aid station.

In Room 101, a 2036 sq. ft. switchgear and power distribution equipment poses a fire hazard due to the high voltage associated with the equipment. The most significant fire hazard in 101A is the two boilers that occupy approximately one-third of this building. There is one Cleaver Brooks 35,000 pound per hour steam boilers and two model CB 600-500 150 psi Cleaver Brooks Boilers. All boilers are ignited using propane and begin firing number two oil and then switch over to number five oil as quickly as possible. This building has a full coverage sprinkler system. The combustible loading in this room is minimal. Good house keeping practices were being adhered to in the room.

The center portion of the building was formally occupied by the fire department is now a vehicle maintenance shop and has light storage of combustible material such as motor oils and greases.

A remaining area of 603 includes a bunkroom and 1st aid station have hazards associated with general storage and office equipment. The bunk area is equipped with a kitchen but has full sprinkler coverage.

The building is well detached from TAN other structures but there is an exposure issue associated with a small LPG tank and approximately 9 feet north of this building is located TAN 659. TAN 659 is manufactured hazardous material storage lockers that contain water treatment chemical used in the boiler operations. The facility has a dry channel fire suppression system.

4.2. Runoff/Contamination of Fluids

TAN-603 contains no Category 3 quantities of radiological materials, hazardous or mixed waste. Given this, there is no concern regarding the spread of contaminated or hazardous materials due to runoff.

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5. FIRE PROTECTION

5.1. Water Supply and Distribution Systems

TAN-TSF has a combined fire and portable water system consisting of a piping loop supplied by multiple fire pumps from a single 500,000-gallon tank. Adequate sectional valves are provided to allow isolation for pipe breaks. Details are found in TAN-TSF Area FHA (reference 12.3.1).

The nearest hydrant is located 150' northwest of the building.

5.2. Fire Suppression

This building is protected throughout by a wet pipe automatic sprinkler system. The system was modified per ECF-2020. This modification changed the supply for this system from the fire line to the domestic line supply and reduced the riser from a six inch line to a four inch line. This modification provides 490 gpm at 97 psi and meet both flow and pressure requirements. This system provides a minimum density for 0.19 gpm per square foot over the hydraulically most remote 1800 square feet. 212 degree heads are installed in the boiler house and 165 degree heads are installed in other locations throughout the building. Sprinkler spacing is less than 130 square feet per sprinkler in all area. Fire extinguishers, appropriate for the hazard in the building, are located in accordance with NFPA 10, "Portable Fire Extinguishers".

5.3. Fire Alarm System

There are two battery operated, stand along ionization smoke detectors in Room 101 and one ionization smoke detector located in Room 102. Smoke detectors connected to the FS system should be provided fire alarms from the facility are connected to a KIDDE KDR-1000 Fire Alarm Control Panel (FACP) which is called Multiplex Interface Panel (MIP) 3, located in TAN-601. Output from the MIP is sent to the INEEL FAC, which notifies the fire department, security, and all TAN occupants via the Automatic Voice Announcement System (AVAS). More information is provided in the TAN-TSF Area FHA (reference 12.3.1).

5.4. Adequacy of Protection

The provided protection and installed systems provide suppression and alarm capabilities adequate to comply with DOE Orders and limit damage potentials to acceptable limits. The system has been incorporated into the facility P.M. program to ensure adequate inspection testing and maintenance of this program.

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5.5. Fire Department/Incident Response Team (IRT)

TAN also maintains an Incident Response Team (IRT). The IRT and INEEL Fire Department train together and have developed a good working relationship. IRT members provide the Fire Department with a thorough working knowledge of the facility. More details are included in the TAN-TSF Area FHA (reference 12.3.1).

5.6. Pre-Fire Plans

The Fire Department Station #3 updated the pre-fire plans for this building in September 1999. The current plan addresses the Fire Department's needs and concerns.

5.7. Apparatus Access

Fire Department response is through the Specific Manufacturing Capabilities (SMC) Guardhouse. The Fire Department tracks response times, and are routinely under 5 minutes from notification to an on scene arrival. Equipment access to the building is via paved surfaces to the north and west of the building. The Engine Company will respond to the north of the building.

6. Facility Equipment and Program Preservation

6.1. Protection of Essential Safety Class Systems

TAN-603 has no safety class structures, systems, or components.

6.2. Identification of Vital Programs Impacted

TAN-603 has no vital programs.

6.3. Identification and Protection of Critical Process Equipment

TAN-603 has no critical process equipment.

6.4. Identification and Protection of High Dollar Value Equipment

TAN-603 has no High Dollar Value Equipment.

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6.5. Facility Damage Potential

Maximum Possible Fire Loss (MPFL) is the largest possible loss without intervention by automatic or manual means, including employees, IRT, and Fire Department. Passive features, such as fire separations are assumed to operate properly. This scenario usually results in the loss of an entire fire area regardless of the provisions of automatic suppression systems, and is considered as the worst possible fire, regardless of ignition type or location.

Building equipment values from a 1997 Department of Energy Idaho (DOE-ID) Facilities Information Management System (FIMS) (reference 12.1.6) are reported at \$641,440. The MPFL for this facility is estimated at \$641,440 (100%).

Maximum Credible Fire Loss (MCFL) is the largest possible fire without manual intervention. Automatic suppression systems are allowed to operate to control a fire. However, there are no suppression systems in the building and the building consists of a single fire area. Therefore, the MCFL for the facility is also \$641,440.

6.6. Security Coordination

Access to the TAN facilities is controlled by administrative controls which include key card access.

7. PROGRAM DOCUMENTATION

7.1. Currency and Completeness of the FHA

Given the present guidelines and low building values, there is no current Fire Hazards Analysis for this building. This FSA fulfills the requirements for a building FHA.

7.2. Previous Facility Appraisal Reports

This is the first (FSA) performed for this facility. A facility inspection was completed in February 2000 as part of the ongoing Environmental Safety & Health (ES&H) Inspections, and resulted in one Issue Communication and Resolution Environment (ICARE) items.

7.3. Review of Temporary Protection and Interim Compensatory Measures

Not applicable.

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7.4. Status of Findings from Previous Assessments

A previous FHA was completed on this building in 1993. The building no longer requires a FHA. There are no recommendations from previous assessment.

7.5. Evaluation of Administrative Controls

Administrative controls for TAN-603 are adequate.

7.6. Documentation of Exemptions and Equivalencies

There are no exemptions or equivalencies in place for TAN-603.

8. OPERATIONS AND MAINTENANCE

8.1. Review and Evaluation of Procedures for Inspection, Maintenance, and Testing

Detailed written procedures for testing fire protection and life safety equipment are provided by Life Safety Systems (LSS) and Facilities, Utilities, and Maintenance procedure as addressed in PRD-158 Appendix A requirement. The Facility Fire Protection Engineer (FFPE) reviews procedures upon modification.

8.2. Review and Evaluation of Corrective Actions and Work Order Priority

Not applicable.

8.3. Fire Protection Engineering Staffing

A FPE is on staff at TAN, with 24 years experience.

8.4. Facility Management Support of the Fire Protection Program

Recent changes in management have resulted in an increased attention to the Fire Protection Program and associated deficiencies.

9. SUMMARY OF IDENTIFIED DEFICIENCIES

9.1. Deficiencies related to DOE Orders.

None

9.2. Deficiencies Related to NFPA Standards.

None

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9.3. Deficiencies from Other Codes.

None

9.4. Deviations from Good Practice.

None

10. CONCLUSION

The TAN-603 FSA establishes that, in general, fire protection issues in the building are adequately addressed and meet the intent of DOE Orders 420.1, "Facility Safety" and 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees", except as noted in the following recommendations:

11. RECOMMENDATIONS

11.1 Existing Recommendations:

None

11.2 New Recommendations:

ICARE Report 20755, submitted on 10/18/00. Replace existing battery operated stand along detectors with smoke detectors providing local and remote annunciation and connected to the existing fire alarm system.

12. REFERENCES

The following materials were used as references for this report.

12.1 Department of Energy and Company Documents

U. S. DOE Order 420.1, "Facility Safety", October 24, 1996.

DOE Order 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees", March 27, 1998.

DOE G-420.1/B-0, G-440.1/E-0, "Implementation Guide" for use with DOE Orders 420.1 and 440.1, "Fire Safety Program", September 30, 1995.

DOE-ID Notice ID N 420.A1, "Safety Basis Review and Approval Process", May 11, 1998.

Company Management Control Procedure (MCP) 583, "Fire Safety Assessment", Revision 3, September 22, 1999.

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“DOE Facilities Information Management System (FMIS) Owned Building Cost and Space Report”, August 14, 1997.

Program Requirement Document (PRD-158) “Inspection Testing and Maintenance of Fire Protection System and Equipment”, Revision 0, June 22, 1999.

12.2. Codes and Standards

National Fire Protection Association (NFPA) Codes and Standards.

International Conference of Building Officials, Uniform Building Code, 1997.

International Conference of Building Officials, Uniform Fire Code, 1997.

12.3. Previous Reports

Area Fire Hazard for Test Area North-Technical Support Facility, INEEL HAD-25/SMC-HAD-001, Revision 0, September 30, 1998.

12.4. Associated Drawings

1570 TAN/TSF 608.P.1.

TAN-603, “Fire Alarm System MIP 03 Reporting System Equipment Location Floor Plan”, Drawing 430937, Revision 0, May 20, 1991.

13. Definitions

Codes of Record. The Fire Protection related codes and standards in effect when facility design commenced. These include the Uniform Building Code; Uniform Fire Code; and the NFPA Codes and Standards. The Code of Record remains in effect for the life of the facility unless there is a significant hazard that endangers building occupants or the public.

Type V Definition. A construction type, in which the structural elements are entirely of non-combustible or limited combustible materials and have no fire resistance except for the exterior walls.

Industrial Occupancy. Factories making products of all kinds and properties devoted to operations such as processing, assembling, mixing, packaging, finishing or decorating, and repair.

14. APPENDICES

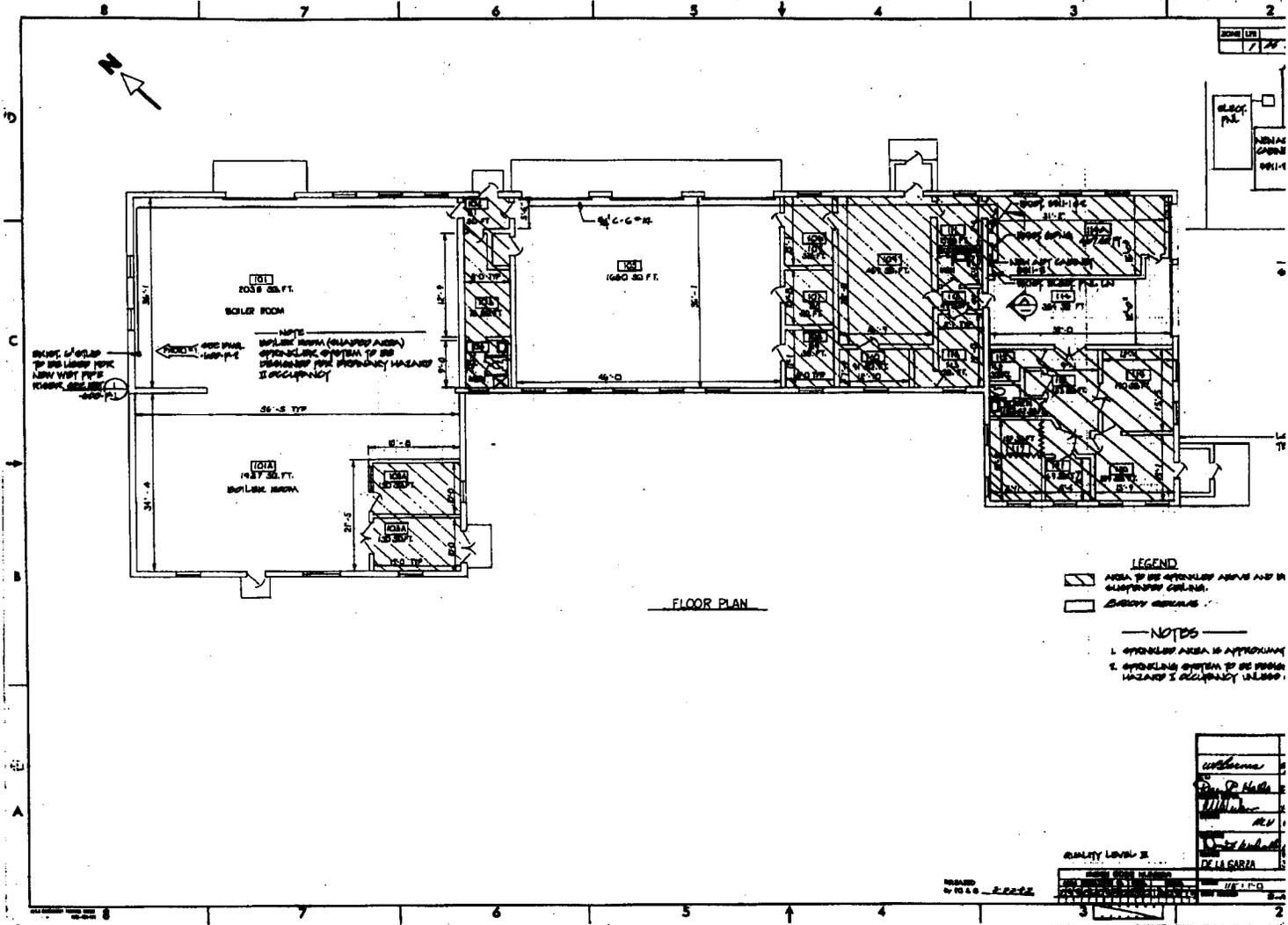
Appendix A, Building Diagram

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TAN BUILDING 603 FIRE SAFETY ASSESSMENT

APPENDIX A



Hazard Analysis

**TAN BUILDING 603
FIRE SAFETY ASSESSMENT**

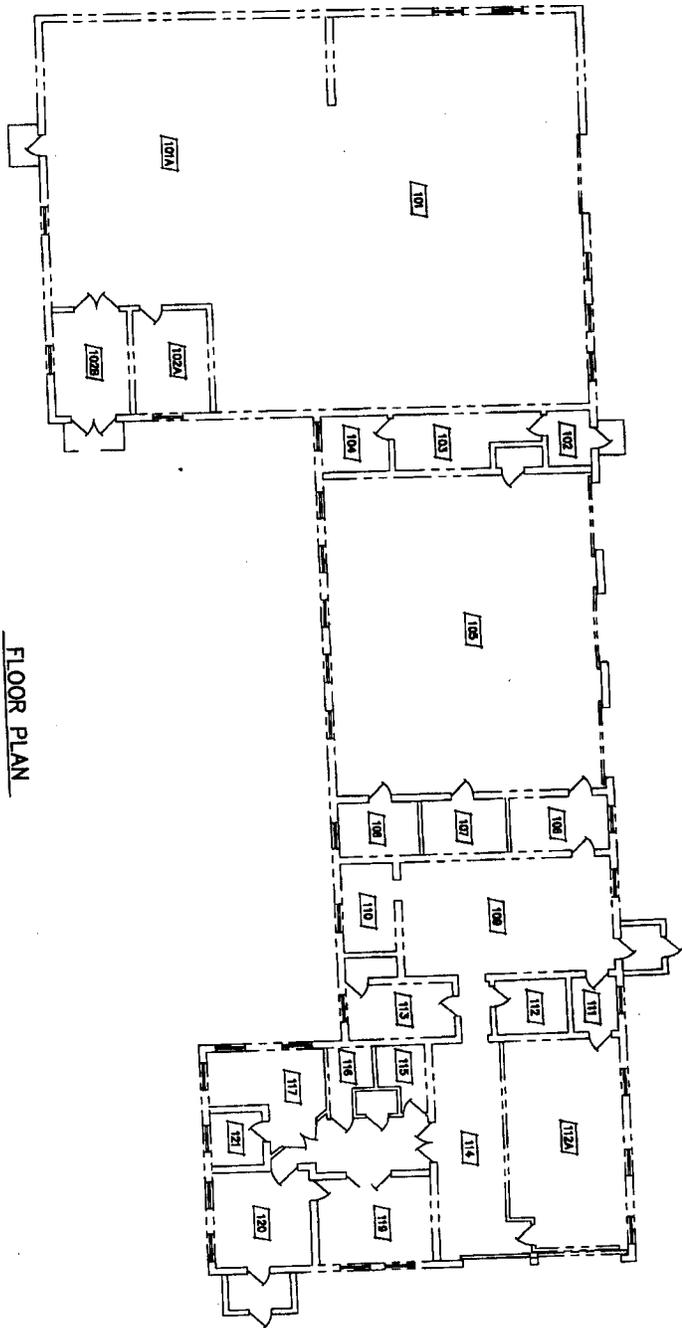
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APPENDIX A



FLOOR PLAN