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TRM2 - TECHNICAL REQUIREMENTS MANUAL UNIT 2

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# SSES MANUAL

Manual Name: TRM2

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 2

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Rev. 3

Fire Suppression Water Supply System  
3.7.3.1

3.7.3 Fire Protection

3.7.3.1 Fire Suppression Water Supply System

TRO 3.7.3.1 Two Fire Suppression Water Supply Subsystems shall be OPERABLE

APPLICABILITY: At all times

ACTIONS

----- NOTE -----  
1. The provisions of TRO 3.0.4 are not applicable.  
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CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One fire suppression water supply subsystem inoperable.	A.1 Restore the inoperable fire suppression water supply subsystem to OPERABLE status	7 days
	<u>OR</u> A.2 Establish an alternate fire suppression water supply subsystem.	7 days
B. Both fire suppression water supply subsystems inoperable.	B.1 Establish an alternate fire suppression water supply subsystem	24 hours
	<u>AND</u> B.2 Restore an inoperable fire suppression water supply subsystem to OPERABLE status	7 days

## TECHNICAL REQUIREMENT SURVEILLANCE

## NOTE

When a system is placed in an inoperable status solely for the performance of required Surveillances, entry into associated Conditions and required Actions may be delayed up to 1 hour.

SURVEILLANCE		FREQUENCY
TRS 3.7.3.1.1	Verify the minimum contained fire suppression water supply volume.	7 days
TRS 3.7.3.1.2	Verify that the overall diesel driven fire pump diesel engine starting 24 volt battery bank and charger battery voltage is greater than or equal to 24 volts.	31 days
TRS 3.7.3.1.3	Verify that the diesel driven fire pump diesel engine starting 24 volt battery bank and charger pilot cell specific gravity, corrected to 77°F, is greater than or equal to 1.200.	31 days
TRS 3.7.3.1.4	Verify that the diesel driven fire pump diesel engine starting 24 volt battery bank and charger electrolyte level of each pilot cell is above the plates.	31 days
TRS 3.7.3.1.5	Start the electric motor driven fire pump and operate it for at least 15 minutes on recirculation flow.	31 days
TRS 3.7.3.1.6	Verify that each manual, power operated or automatic valve, in the fire suppression water supply system flow path is in its correct position.	92 days
TRS 3.7.3.1.7	Verify the diesel driven fire pump fuel storage tank contains at least 250 gallons of fuel.	31 days
TRS 3.7.3.1.8	Start the diesel driven fire pump from ambient conditions and operate for greater than or equal to 30 minutes on recirculation flow.	31 days

(continued)

## TECHNICAL REQUIREMENT SURVEILLANCE (continued)

SURVEILLANCE		FREQUENCY
TRS 3.7.3.1.9	Verify that a sample of the diesel driven fire pump diesel fuel from the fuel storage tank is within the acceptable limits when checked for viscosity, water and sediment.	92 days
TRS 3.7.3.1.10	Verify that the diesel driven fire pump diesel engine 24 volt battery bank specific gravity is appropriate for continued service of the battery.	92 days
TRS 3.7.3.1.11	Cycle each fire suppression water supply system testable valve in the flow path through at least one complete cycle of full travel.	12 months
TRS 3.7.3.1.12	Perform a system flush of the fire suppression water supply system.	12 months
TRS 3.7.3.1.13	Perform a system functional test of the fire suppression water supply system.	18 months
TRS 3.7.3.1.14	This TRS is not used.	
TRS 3.7.3.1.15	Verify that each fire pump develops at least 2500 gpm at a system head of 125 psig.	18 months
TRS 3.7.3.1.16	Verify that the diesel engine driven fire pump diesel engine 24 volt battery bank cell and battery racks show no visual indication of physical damage or abnormal deterioration.	18 months
TRS 3.7.3.1.17	Verify that each fire pump starts sequentially to maintain the fire suppression water supply system pressure greater than or equal to 85 psig.	18 months

(continued)

## TECHNICAL REQUIREMENT SURVEILLANCE (continued)

SURVEILLANCE		FREQUENCY
TRS 3.7.3.1.18	Verify that the diesel driven fire pump diesel engine starting 24 volt battery bank Terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material.	18 months
TRS 3.7.3.1.19	Perform diesel driven fire pump diesel engine inspection.	18 months
TRS 3.7.3.1.20	Perform a fire suppression water supply system flow test.	3 years

## B 3.11.1.1 Liquid Effluents Concentration

BASES

**TRO** This requirement is provided to ensure that the concentration of radioactive materials released in liquid waste effluents to UNRESTRICTED AREAS will be less than 10 times the concentration levels specified in 10 CFR Part 20.1001 to 20.2402, Appendix B, Table 2, Column 2. The requirement provides operational flexibility for releasing liquid effluents in concentrations to follow the Section II.A and II.C design objectives of Appendix I to 10 CFR part 50. This limitation provides reasonable assurance that the levels of radioactive materials in bodies of water in UNRESTRICTED AREAS will result in exposures within (1) the Section II.A design objectives of Appendix I, 10 CFR 50, to a Member of the Public and (2) restrictions authorized by 10 CFR 20.1301(e). The concentration limit for dissolved or entrained noble gases is based upon the assumptions that Xe-135 is the controlling radionuclide and its effluent concentration in air (submersion) was converted to an equivalent concentration in water. This requirement does not affect the requirement to comply with the annual limitations of 10 CFR 20.1301(a). This requirement applies to the release of radioactive materials in liquid effluents from all units at the site. The required detection capabilities for radioactive materials in liquid waste samples are tabulated in terms of the lower limits of detection (LLDs). Detailed discussion of the LLD and the other detection limits can be found in Curie, L.A., "Lower Limit of Detection: Definition and Elaboration of a Proposed Position for Radiological Effluent and Environmental Measurements." (References 2, 3, and 4)

This section of the TRM is also part of the ODCM (Reference 2).

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<b>Actions</b>	The Actions are defined to ensure proper corrective measures are taken in response to exceeding the TRO limits.
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<b>TRS</b>	The TRSs are defined to be performed at the specified Frequency to ensure that the parameters are maintained within the TRO limits. Table 3.11.1.1-1 defines Radioactive Liquid Waste Sampling and Analysis Program. The lower limit of detection (LLD) is defined, for purposes of these Requirements, as the smallest concentration of radioactive material in a sample that
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(continued)

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## B 3.11.1.1 Liquid Effluents Concentration

## BASES (continued)

TRS  
(continued)

will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal. For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{4.66s_b}{E \cdot V \cdot 2.22E6 \cdot Y \cdot \exp(-\lambda\Delta t)}$$

Where:

LLD is the *a priori* lower limit of detection as defined above (as microcuries per unit mass or volume).

$s_b$  is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute),

E is the counting efficiency, as counts per disintegration,

V is the sample size, in units of mass or volume,

2.22 E6 is the number of disintegrations per minute per microcurie,

Y is the fractional radiochemical yield, when applicable.

$\lambda$  is the radioactive decay constant for the particular radionuclide, and

$\Delta t$  for plant effluents is the elapsed time between the midpoint of sample collection and time of counting.

Typical values of E, V, Y, and  $\Delta t$  should be used in the calculation.

It should be recognized that the LLD is defined as an *a priori* (before the fact) limit representing the capability of a measurement system and not as an *a posteriori* (after the fact) limit for a particular measurement.

A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses, each batch shall be isolated, and then thoroughly mixed to assure representative sampling.

(continued)

## B 3.11.1.1 Liquid Effluents Concentration

## BASES (continued)

TRS  
(continued)

The principal gamma emitters for which the LLD specification applies include the following radionuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141 and Ce-144. The dissolved and entrained gases (gamma emitters) for which the LLD specification applies include the following radionuclides: Kr-85, Kr-85m, Kr-87, Kr-88, Ar-41, Xe-133, Xe-133m, Xe-135, and Xe-135m. This list does not mean that only these nuclides are to be considered. Other gamma peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in accordance with the ODCM.

A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen that is representative of the liquids released over a period no longer than the Minimum Analysis Frequency.

The Minimum Analysis Frequency as listed for the Composite Samples shall mean the minimum frequency for initiation of the required analyses, not completion of the analyses and evaluation of the results. Since the analysis involves sending the samples to an offsite laboratory and performance of involved sample preparation and wet chemical analyses, there will be a delay between initiation of the analysis and receipt of the results.

The analysis initiation shall normally be done on a calendar month for the 31 day frequency or calendar quarter for a 92 day frequency.

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| REFERENCES | <ol style="list-style-type: none"><li>1. Technical Specification 5.5.4 - Radioactive Effluent Controls program.</li><li>2. Technical Specification 5.5.1 - Offsite Dose Calculation Manual.</li><li>3. NUREG/CR-4007, September, 1984.</li><li>4. 10 CFR Part 20.</li></ol> |
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