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US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Dear Sirs:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Annual Update to the Interim Solid Waste Staging Facility
Technical Evaluation Report

Pursuant to NRC letter dated February 4, 1982, attached is the annual update to the Interim Solid Waste Staging Facility (ISWSF) Technical Evaluation Report (TER). The changes to this TER are listed in the "Summary of Change" on Page 2 of the TER. The primary purpose of this update is to allow temporary storage of radioactive material in the ISWSF yard area under certain conditions described in revised Section 2.4.1 of the TER. Though numerous changes have been made to this TER, GPU Nuclear contends that these changes satisfy the criteria of 10 CFR 50.59; thus, NRC approval of this revision is not required.

Sincerely,

F. R. Standerfer
Director, TMI-2

RDW/emf

Attachment

cc: Senior Resident Inspector, TMI - R. J. Conte
Regional Administrator, Region 1 - W. T. Russell
Director, Plant Directorate IV - J. F. Stolz
Systems Engineer, TMI Site - L. H. Thonus

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TER 3230-008 REV 8

ISSUE DATE September 1988

☒ ITS
☐ NSR
☐ NITS

DIVISION

TECHNICAL EVALUATION REPORT

FOR

INTERIM SOLID WASTE STAGING FACILITY

COG ENG Eric Schultz 8/16/88 DATE 8/16/88

RTR Eric Schultz 8/16/88 DATE 8/16/88

COG ENG MGR. RE Sieglaff 8/16/88 DATE 8/16/88

Rev.	SUMMARY OF CHANGE	Approval	Date
0	No History Available.		
1	No History Available.		
2	No History Available.		
3	Reissue per GPU Nuclear letter 4410-82-L-0009.		1/82
4	Reissue per GPU Nuclear letter 4410-83-L-0020.		7/83
5	Revise and reissued per ECA 3184-84-0030.		
6	Revised and reissued incorporating comments on Revision 5.		5/85
7	Revised and reissued to include transuranics in the waste.		6/86
8	Revised Sections 1.1, 2.1, 2.2.4, and added new Section 2.2.4.6 to clarify that the ISWSF consists of the building and yard area. Revised Sections 1.1, 1.3a, 2.1, 2.4.1, 2.4.2, 5.1, and 5.2 to indicate that the ISWSF area may be utilized for temporary storage of radioactive material under certain conditions. Revised 2.2.4.5 to clarify that the Personnel Monitoring/Analysis Area may contain equipment for personnel monitoring or may be used for swipe sample analysis. Revised Section 3.2.1.1 to delete distance references since distances may vary depending on whether radioactive material is located in the yard area. Revised Sections 2.2.4.1, 2.2.4.2, 2.2.4.4, 2.4.1, and 2.4.2 to reflect current ISWSF operations/conditions.		9/88

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1.0 INTRODUCTION

1.1 General

The cleanup effort at Three Mile Island Unit 2 is expected to result in the generation of a significant quantity of low level (Note 1) solid or solidified radioactive waste. In addition, low level solid or solidified radioactive waste is also being generated in Unit 1. Due to limitations on low level radioactive waste disposal sites and limited on-site staging capacity, an additional facility for the collection and temporary staging of low level solid or solidified radioactive material is needed.

The facility proposed to fulfill the need identified above is the Interim Solid Waste Staging Facility (ISWSF) which is described in Sections 2.2.3 and 2.2.4.

This Technical Evaluation Report (TER) demonstrates that the ISWSF has been designed and will be operated in such a manner as to provide assurance that:

a. The health and safety of the public will be protected.

b. Occupational exposures will be as low as reasonably achievable (ALARA).

c. There will be no adverse impact on the environment.

1.2 Organization of Report

This report is organized in the format of a combined safety analysis and environmental report. Following this introduction, a description of the design and operational considerations is presented. This is followed by a discussion of the safety and environmental issues associated with the facility. A comparison of the ISWSF design with the Programmatic Environmental Impact Statement is presented next. The report concludes with the safety evaluation required by 10 CFR 50, paragraph 50.59, "Changes, Tests, and Experiments."

1.3 Conclusion

The information provided in this report results in the following conclusions:

a. The ISWSF fulfills the need for a facility to temporarily stage low level solid or solidified radioactive material.

Note 1. As used herein the term "low-level" refers to the dose rate on contact with the waste packages as defined in Table 2-1. The term gives no indication as to the isotopic or elemental content of the package.

b. The operation of the facility is not an unreviewed safety question as defined in 10 CFR Part 50, paragraph 50.59.

2.0 FACILITY DESCRIPTION

2.1 Purpose of the Facility

The ISWSF may be used for the staging of low level solid or solidified radioactive waste packages from both Units 1 and 2 prior to shipment off-site. Additionally, the ISWSF area may be utilized for storage of radioactive material pursuant to Section 2.4.1. The packages shall not be staged in the facility for a period greater than 5 years.

2.2 Summary Description

2.2.1 Location

As shown on Figure 2-1, the ISWSF is located east of the Unit 2 turbine building and between the off-site transmission lines for Unit 2. It is surrounded by an outer fence which aids in restricting access to the area immediately surrounding the facility. One section of the outer fence is common to the switchyard fence, and another section is part of the site fence located on the island along the east channel of the river. Access to the area enclosed by the outer fence will be controlled by established plant procedures. The only activities occurring within this area will be those associated with the ISWSF.

2.2.2 Design Basis

The ISWSF has no safety design basis.

The facility is designed to provide a controlled but ready access for material handling operations to ensure that operator exposures are maintained ALARA. The facility is sized to accommodate the wastes generated in 6 months from Units 1 and 2. The monthly waste generation rates used in the design are given in Table 2-1.

The ISWSF is designed to conform with 10 CFR Part 20, paragraph 105(b)(2). This is accomplished by establishing a restricted area around the facility, composed of the area inside the outer fence and a section of the adjacent switchyard enclosure. The facility is also designed to meet the requirements of 40 CFR Part 190 at the site boundary and beyond.

2.2.3 Building Description

The ISWSF building, shown in Figure 2-2, is a pre-engineered metal building on a non-seismic Category I concrete floor slab. Shielding partitions of grout-filled concrete masonry units (CMU) are used to satisfy the dose rate criteria specified in Section 2.2.2. A roof is provided over the truck bay to allow unloading and loading of trucks during adverse weather conditions.

A curb to elevation 302'-8" is provided around the perimeter of the floor slab to contain any rainwater that may enter the building. The floor slab is sloped so that any water entering the facility will be directed toward one of the six sumps provided. With the use of portable pumps, water collected in these sumps will be disposed of in accordance with established plant operation procedures. The sumps are provided with manually actuated heaters to facilitate disposal of collected water during the winter.

The floor slab, sumps, and curb are epoxy coated for ease of decontamination, should the need arise. The steel columns, siding and the roof framing have a protective finish. The shielding partition surfaces are painted with a sealer.

With the exception of small quantities of electrical cable associated with electrical power and the in-plant paging system, all materials used in the construction of the facility are non-combustible.

2.2.4 General Arrangement

The ISWSF consists of seven (7) basic areas: (1) loading/unloading, (2) survey, (3) open staging, (4) large shielded staging, (5) small shielded staging, (6) personnel monitoring/ analysis, and (7) yard area. A discussion of these areas follows. The general arrangement of the facility is shown in Figure 2-2.

2.2.4.1 Loading/Unloading Area

The loading/unloading area consists of a truck bay, an asphalt pad, ramps into the facility, and areas for the loading and unloading of vehicles.

2.2.4.2 Survey Area

A survey area is provided to allow for radiation surveys of radioactive material packages. This area is separated from the truck bay and the open staging area by shield partitions.

2.2.4.3 Open Staging Area

The open staging area is separated from the survey area by a shield partition. Access routes, or aisles, with gates at the entrance, allow for the movement of the containers by a forklift to the appropriate area. A unique number that identifies each container and its unit of origin will be assigned to each waste container stored in the area.

2.2.4.4 Shielded Staging Areas

Shielded staging areas are provided in order to meet the dose rate limits specified in the design basis, Section 2.2.2. Separate shielded areas are provided in order to allow separation of containers. Access to these areas is through sliding gates by means of the aisles identified in Section 2.2.4.3. Access will be controlled by administrative procedures.

2.2.4.5 Personnel Monitoring/Analysis Area

The personnel monitoring/analysis area is a small cubicle at the end of the loading/unloading area. This area may contain equipment for personnel monitoring or may be used for swipe sample analysis.

2.2.4.6 Yard Area

The yard area surrounds the ISWSF building and is enclosed by the outer fence as described in Section 2.2.1.

2.3 Major Systems

The only systems provided for the operation of the ISWSF are electrical power for lighting, receptacles, sump heaters, roll up door and the in-plant paging system. None of these systems serve any safety-related function.

No fixed radiation monitors are provided in the facility. Radiation monitoring will be performed by Radiological Controls Personnel according to approved procedures. Access is controlled to the area inside the outer fence and to the switchyard, where dose rates could exceed allowable limits for an unrestricted area.

2.4 Material Handling Operations

2.4.1 Description of Packages

The packages to be staged in the ISWSF are of several types. Examples of these are described below.

55-gallon drums of compacted trash and/or solidified radioactive waste placed on 4-foot by 4-foot pallets. Depending on the weight of each drum, they may be banded together.

50-cubic-foot liners of radioactive waste placed on 4-foot by 4-foot pallets. The dimensions of the liner are approximately 4 feet in diameter and 4 feet high.

There will also be metal low specific activity (LSA) boxes containing compacted or non-compacted trash. The dimensions of the LSA boxes are approximately 4 feet x 4 feet x 7 feet. These boxes will arrive at the facility with a spacer as necessary to allow a forklift to readily lift the box.

All waste packages received in the ISWSF will be properly prepared for shipment or storage as appropriate. Packaging of these items will meet 49 CFR Criteria. Counting, swiping, decontamination, and weighing will be done prior to the transfer of the packages to the ISWSF. Provisions have been included in the design of the ISWSF to allow additional counting and swiping in the ISWSF.

Radioactive waste received for shipment or temporary storage may be placed inside or outside the ISWSF building. The placement should consider dose rate, handling, storage duration, and the container's ability to withstand environmental conditions. No container shall be opened for repackaging or inspection in this area.

Storage of items to be reused within the plant will be considered on a case-by-case basis and will be approved in writing by the Unit 2 Waste Management Department and Radiological Controls Director. Packaging of these will meet 49 CFR criteria and will satisfy the criteria of this TER. Storage of these items within the ISWSF should not exceed one (1) year past the entry into Post-Defueling Monitored Storage (PDMS).

2.4.2 Unloading and Stacking of the Packages

Upon arriving at the facility, the vehicle containing the package(s) will normally be placed either in the Truck Bay located in the loading/unloading area or on the asphalt pad located on the south side of the facility. At this point, a forklift will normally unload the packages and transport them to the proper area of the facility.

For packages which are to be stored in the ISWSF yard area, the vehicle will be parked in an appropriate location to facilitate unloading.

Upon arriving at the proper location within the ISWSF building, the packages may be stacked, as necessary. The pallets and boxes will be stacked no more than three high, which is consistent with current GPU practice. In general, the pallets will be stacked in a staggered manner. The LSA boxes will be stacked one on another with spacers. These spacers are normally an integral part of the LSA box.

The required lift height of approximately 10 feet is well within the 16-foot lifting height of the forklift. The capability of the pallets to carry the load has been checked for the design basis arrangement and has been found acceptable. The pallets are of four stringer design, with solid planking top and bottom.

Items/packages that may be stored in the ISWSF yard area shall be stacked one high and will be handled in accordance with proper accepted rigging and handling practices.

2.4.3 Removal of Packages

When a package is removed for shipment, the reverse of the procedure described in the previous section will be followed.

TABLE 2-1

DESIGN STORAGE REQUIREMENTS

Unit	Quantity (per month)	Canister/ Trash Type	Radiation Level
1	37	55 gal drum/compacted trash	up to 50 mrem/hr
1	19	55 gal drum/compacted trash	50 to 100 mrem/hr
1	15	55 gal drum/compacted trash	100 to 200 mrem/hr
1	4	55 gal drum/compacted trash	200 - 400 mrem/hr
1	1	4'x4'x7' box/compacted trash	up to 200 mrem/hr
1	10	50 ft^3 liners/solidified evaporator bottoms	200 - 500 mrem/hr
2	9	55 gal drum/solidified radiac waste	up to 100 mrem/hr
2	16	55 gal drum/compacted trash	0 to 1 mrem/hr
2	6	55 gal drum/compacted trash	1 to 2 mrem/hr
2	11	55 gal drum/compacted trash	2 to 5 mrem/hr
2	9	55 gal drum/compacted trash	5 - 20 mrem/hr
2	5	55 gal drum/compacted trash	20 - 100 mrem/hr
2	2	55 gal drum/compacted trash	100 - 500 mrem/hr
2	1	55 gal drum/compacted trash	500 - 1000 mrem/hr
2	1	55 gal drum/compacted trash	1000 - 2000 mrem/hr
2	2	4'x4'x7' LSA boxes	0 - 1 mrem/hr
2	2	4'x4'x7' LSA boxes	1 - 2 mrem/hr
2	3	4'x4'x7' LSA boxes	2 - 10 mrem/hr
2	3	4'x4'x7' LSA boxes	10 - 20 mrem/hr
2	3	4'x4'x7' LSA boxes	20 - 100 mrem/hr
2	1	4'x4'x7' LSA boxes	100 - 200 mrem/hr

3.0 TECHNICAL EVALUATION

This section summarizes the licensing issues which were considered in the design of the ISWSF. These issues deal with the expected performance of the facility during normal operation and various design basis events.

3.1 Licensing Issues

The licensing issues associated with the operation of the ISWSF are:

a. Demonstrating compliance with 40 CFR Part 190 with respect to off-site doses.

b. Demonstrating compliance with 10 CFR Part 20 with respect to on-site dose limits.

c. Demonstrating that the design basis events for the facility have been properly considered. The design basis events for this facility are high winds, operating basis earthquake, fire, and flooding.

d. Demonstrating compliance with the principles of ALARA.

Each of these issues is addressed in the following sections.

3.2 Dose Assessment

The ISWSF is designed so that during normal operation (1) the requirements of 40 CFR Part 190 are met at the site boundary and beyond, and (2) the dose rates at the boundary of the restricted areas conform to 10 CFR, Part 20, paragraph 105 (b)(2). This paragraph requires that the radiation levels in unrestricted areas be such that if an individual were continuously present in the area for seven consecutive days, he would not receive a dose in excess of 100 millirem (0.6 mrem/hr). The consequences of design basis events have been evaluated to assure that public use of areas beyond the exclusion areas is not interrupted or restricted.

This section presents the analyses that demonstrate the above objectives are met.

3.2.1 Off-Site

3.2.1.1 Normal Operation

The total annual off-site dose from the site to any individual is limited to 25 mrem by 40 CFR Part 190. The nearest site boundary for the ISWSF is the normal high water mark on the east bank of the island.

As applied to the site boundary, the 40 CFR Part 190 limits equate to a 0.3 mrem/hr dose rate based on a 67 hr/yr occupancy (Note 2) with an 80 percent contribution factor (80 percent of the total 25 mrem). As explained in Section 3.2.2, the dose rate at the fence inside the site boundary is below 0.6 mrem/hr. The dose rate at the site boundary at the normal high water line of the river will be much less than the 0.3 mrem/hr allowable, due to the shielding effect of the flood protection dike.

In addition to satisfying 40 CFR Part 190 at the site boundary an analysis was performed to determine the dose resulting from the ISWSF at the nearest residence. The dose at the nearest residence, located ENE of the facility, was determined to be 13 mrem/yr.

A general purpose gamma ray scattering code was used to determine the annual dose from direct and scattered radiation at the nearest residence. The code used was the G-33 version of "G^3: A General Purpose Gamma-Ray Scattering Program," described in Los Alamos Scientific Laboratory publication LA 5176, dated June 1973.

The calculation of the dose rate at the nearest residence included the following considerations:

a. The ISWSF was assumed to contain the waste generated in six months at the monthly generation rates given in Table 2-1.

b. The predominant radionuclide encountered in the Unit 2 containment, Cesium-137, was assumed to be the source of radiation in all waste packages.

c. The factor of 0.7 specified in Regulatory Guide 1.109, Revision 1, was used to account for shielding and occupancy characteristics at the nearest residence.

In the future, the waste from Unit 1 to be staged in the facility is likely to contain Co-60. An assessment of the effect of Co-60 on the off-site dose calculation is summarized below.

The skyshine dose calculation was performed using a point-kernel theory computer code which accounts for the scattering in air. The degradation of the scattered photon's energy is determined from the incident energy and angle of scatter of the uncollided photons. The Klein-Nishina differential scattering cross section formulation is used to assess the probability of scattering from the differential scattering volume (air). Multiple scattering in air is also accounted for by applying a buildup factor.

The actual skyshine analysis was performed assuming the source was Cs-'37 (.662 MeV). To assess the impact of this assumption the effect of changing the source to Co-60 (1.2 MeV) was evaluated. This evaluation was performed recognizing that there are two major energy dependent parameters used in the analysis which must be addressed to evaluate the effect of changing the incident photon energy:

1. Impact on total source strength, and

2. Impact on the scattering cross sections.

The incident energy used in the actual analysis was 0.662 MeV to represent Cs-137. The total source strength (particles/second) used in the analysis was determined from the contact dose rate for the waste containers along with the flux-to-dose rate conversion factor (DCF) obtained using ANSI/ANS 6.1.1-1977 (N666), "Neutron and Gamma-Ray Flux-To-Dose Rate Factors," March 17, 1977. To assess the impact on the total source strength caused by changing the source energy to that of Co-60, a new source strength is again deduced assuming the same contact dose rate along with the appropriate energy dependent DCF from ANSI/ANS 6.1.1-1977. Based on the above, the total source strength would be reduced by 50 percent if the source is assumed to be 1.2 MeV photons.

The resulting change to the scattering probability is indicated by the magnitude of the buildup factor. For a given number of mean-free paths the buildup factor will be higher for the lower energy.

Hence, if Co-60 is assumed to be in the waste packages, the total source strength and the degree of scattering would decrease. Therefore, considering Co-60 in place of Cs-137 for part of the Unit 1 waste would not increase the resultant off-site dose.

3.2.1.2 Design Basis Events

Design basis events considered were high winds, an operating basis earthquake, a fire, and flooding.

Note 2. Regulatory Guide 1.109, Rev. 1 Table E-5 Page 40--Recommended values for the maximum exposed individual in lieu of site-specific data.

3.2.1.2.1 High Winds

From the TMI-2 FSAR the design wind velocity, based on the 100-year recurrence interval, is 80 miles per hour at 30 feet above grade. The ISWSF building is enclosed by a combination of CMU walls and galvanized steel siding and is designed to withstand a wind loading of 20 pounds per square foot, which corresponds to a wind speed of more than 80 miles per hour. Therefore enclosure of the ISWSF building protects the radioactive waste containers within the ISWSF building from the effects of the design basis wind loading.

3.2.1.2.2 Operating Basis Earthquake (OBE)

In the event of an OBE, the ISWSF building may collapse; however, the radioactive waste packages would remain in the general area of the facility. The resulting maximum dose to the public from a postulated airborne release would be less than 3.8 mrem for the inhalation pathway. The following considerations were made in this analysis:

- A six month accumulation of waste, based on the requirements listed in Table 2-1, was considered as a potential source of an airborne release.
- The estimated activity of the waste was 100 curies. It was conservatively assumed that the isotopic distribution for this waste is Cs-137 (78%), Sr-90 (18%) and Pu-239 (4%). These isotopes have high dose conversion factors, therefore this assumption will maximize the estimated dose.
- The assumed percentage of transuranics was determined from the ratio of the transuranics to Sr-90 activities calculated from an estimate of the core inventory for TMI-2 using the ORIGEN-2 computer code.
- A release fraction of 10^{-6} of the contents of the drums and boxes was assumed, based on the data presented in "Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants," December 1972.
- The atmospheric dilution factor of 8.1×10^{-4} sec/m^3 was used, based on a Stability Class F, 1 m/sec wind speed, and 1150 feet to the nearest boundary of the exclusion area. No credit was taken for the building wake effect.

3.2.1.2.3 Fire

A fire in the ISWSF will not result in the release of significant quantities of radioactive material. This is based on having the stored radioactive material in sealed metal containers and the surface activity within limits for unrestricted use. In addition, the amount of combustible material, the wooden pallets and small amounts of electrical cable, exposed to an ignition source is insufficient to burn through a container. Also, based on available information regarding the contents of the waste packages, spontaneous combustion within a container will not occur. Based on the above the off-site dose resulting from a fire is bounded by the evaluation presented in section 3.2.1.2.2.

3.2.1.2.4 Flooding

The Three Mile Island site is protected against a design flood of 1,100,000 cfs flow in the Susquehanna River. This protection is furnished by the site dike, which has a minimum elevation of 304 feet along the southern end of the island. In the event of a design flood, which is equivalent to a river level of approximately 300.5 feet, the drainage culvert gate at the southeast dike will close, isolating the site storm drain system from the river. Consequently, the TMI site design flood will have no adverse impact on the ISWSF.

In the event of a probable maximum flood (PMF), the river flow rate will slowly increase to the calculated maximum of 1,625,000 cfs. As the river level increases it will overtop the south dike. The water level on the island will then rise to a maximum PFM flood height of 308.5 feet. As noted in Figure 2.4-7 of the TMI-2 FSAR, an advance warning of at least 36 hours will precede the arrival of PMF.

The ISWSF is not protected against the PMF; therefore the ISWSF will be inundated in the very unlikely event a PMF occurs. The following discussion addresses the possible off-site releases of radioactive materials that could result from submergence of radioactive waste drums and boxes.

Since the waste packages are sealed and ready for off-site shipment, they will resist water intrusion. Should the waste packages leak, releases would be minimal due to the absence of a driving force for release except for diffusion of radionuclides in water. Therefore, in light of the extremely low probability of occurrence of the PMF (recurrence interval greater than 100 years) and the expected minimal leakage into the waste packages, the design of the ISWSF regarding flooding is considered to be adequate.

3.2.2 On-Site

The dose rates outside the restricted areas surrounding the ISWSF were calculated to ensure that the values are less than the 0.6 mrem/hr in accordance with 10 CFR Part 20. This was done by calculating the gamma dose rates from a planar source to a point at a given distance from the source.

The major assumptions made in the performance of this analysis were:

a. The only contributing isotope was Cesium-137.

b. All waste packages were at the maximum contact dose rate given in Table 2-1.

c. The facility was assumed to contain the waste generated in six months, based on the generation rates given in Table 2-1.

The resulting dose at the outer fence surrounding the ISWSF and outside the switchyard enclosure is calculated to be less than 0.6 mrem/hr. These dose rates have been determined to be less than 0.6 mrem/hr based on the information presented in Table 2-1. In order to allow for deviations from this list, a radiation survey will be performed whenever the quantity or arrangement of packages in the ISWSF is significantly altered to ensure that the dose rate at any given point outside the restricted area does not exceed 0.6 mrem/hr.

3.3 Occupational Exposures

Use of the ISWSF will result in occupational radiation exposure to personnel. The operational and maintenance activities to be performed in the facility have been evaluated to determine the length of time workers will be exposed to a radiation environment. This information has been combined with expected radiation fields in the ISWSF to arrive at a projected annual exposure of from 17 to 22 person-rem for this facility. Of this exposure, approximately 80 percent is attributable to radioactive waste originating in Unit 1.

3.3.1 Design Features

Several design provisions have been included in the ISWSF to minimize occupational exposures. These provisions include segregation of waste with higher radiation levels from those with lower radiation levels, use of shielding, and other provisions as noted below.

The arrangement of the ISWSF allows containers to be stored in the low radiation (unshielded) sections of the facility without entering the higher radiation (shielded) sections. The shield wall between the truck loading/unloading area reduces the dose rate in this area from the material in storage.

A roof and siding have been provided for the facility. Siding on the north, south and west sides enclose areas not constructed of CMU walls to minimize the intrusion of rain water which must be collected and sampled prior to disposal. The sumps have been designed so that the shielded areas need not be entered to pump the sumps.

Location of the forklift truck aisles on the outside of the facility rather than using a single central aisle results in a lower radiation field at the aisle.

3.3.2 Person-Rem Estimate

The duration of activities occurring in the ISWSF was estimated by considering the number of radioactive waste packages to be placed in the facility. Factors considered in the analysis of time spent in the radiation area included the following:

a. 55-gallon drums are handled by an unshielded forklift in groups of four drums on a single pallet. The drums are stored on the pallet.

b. LSA boxes and the 50 ft^3 containers are handled one at a time by the forklift.

c. The speed of the forklift was assumed to be three miles per hour except when maneuvering to pick up or store a load.

d. Approximately one-half the time the forklift is in operation it is not carrying a load. This accounts for the return trip to or from the loading/unloading area to the staging areas to pick up another load.

e. Two forklift breakdowns per year in the radiation areas were assumed.

f. Allowances for time spent in the radiation area by other than the forklift operator were made to account for the shipment vehicle driver, health physics technician, and a laborer to assist the forklift operator.

g. An allowance has been made for relocating containers within the facility.

The radiation fields in which the activities in the ISWSF occurred were estimated using the number of radioactive waste packages in the facility, and the dose rate of each package. Factors considered in the determination of the radiation fields included the following:

a. The LSA boxes were assumed to be planar sources, with the dose calculated on a perpendicular to the plane at the desired distance.

b. For cylindrical containers, the source was modeled as an infinite cylinder and only cylindrical spreading was assumed.

c. No credit was assumed for the shielding effect of the content of one container on an adjacent container except in the case of solidified waste in 50 ft^3 liners.

d. The ISWSF was assumed to contain a six-month inventory of containers at all times.

The area radiation levels calculated for the various areas in the ISWSF are given in Table 3-1.

The person-rem assessment combined the radiation fields described above with each of the handling, maintenance, and vehicle survey activities. The evolutions evaluated included transit of a loaded vehicle from Unit 1 or Unit 2 to the ISWSF, placing the containers in storage, removing the containers from storage to the shipment vehicle at a later point in time, and a health physics survey of the shipment vehicle.

Assuming that the person-rem exposures from the ISWSF activities control the number of workers required to conduct material handling operations, the following approximate number of personnel would be required for the operation of this facility during the year:

Function	Number of Workers	Total Dose
Health Physics Technicians	.1	.5 rem
Forklift Operators	4	16 rem (max.)
All other functions (laborers, truck drivers, maintenance personnel)	1 equivalent worker	5 rem total

TABLE 3-1

AREA RADIATION LEVELS WITH
SIX MONTHS DESIGN BASIS INVENTORY

Area	Radiation Level (mrem/hr)
Survey Area	0.5
Open Staging Area	
Unit 2 LSA boxes	60
Unit 2 drums	180
Unit 1 drums	180
Shielded Staging Area	
Unit 1	1600
Unit 2	1170

4.0 COMPARISON WITH PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (PEIS)

Section 9.2.1.1 of the PEIS describes a facility for the temporary storage of certain low level radioactive wastes. The contents of the facility are given in Table 4-1. The radiation levels at the fence surrounding the facility will be less than 0.6 mrem/hr. This facility is judged in Section 9.5.1.2 of the PEIS to have negligible environmental exposures to the general population.

There are some minor differences between the ISWSF described in this report and the facility described in the PEIS. These differences are primarily in the number of containers to be stored in the ISWSF. Table 4-1 contains the design basis contents of the PEIS facility compared to the ISWSF. However, as shown in this report, the ISWSF will result in negligible environmental exposures to the general population.

TABLE 4-1

CONTENTS OF STAGING FACILITY

	PEIS Facility	ISWSF
55-Gallon Drums	800	810
LSA Boxes	150 (4 ft x 3 ft x 6 1/2 ft) wooden	90 (4 ft x 4 ft x 7 ft) metal
50-ft^3 Liners	60	60

5.0 SAFETY EVALUATION

10 CFR 50, paragraph 50.59, "Changes, Tests, and Experiments," permits the holder of an operating license to make changes to the facility provided the change does not involve a modification of the plant technical specifications and the change is determined not to be an unreviewed safety question. As summarized below, the operation of the ISWSF neither requires a modification to the plant technical specifications nor is it deemed to be an unreviewed safety question as defined in 10 CFR 50, paragraph 50.59.

5.1 Technical Specifications

There are no Recovery Technical Specifications regarding the storage of solid or solidified radioactive material. The proposed change does not require any additional technical specifications in order to satisfy the licensing basis of the plant. Therefore, the operation of the ISWSF does not require changes to the existing technical specifications.

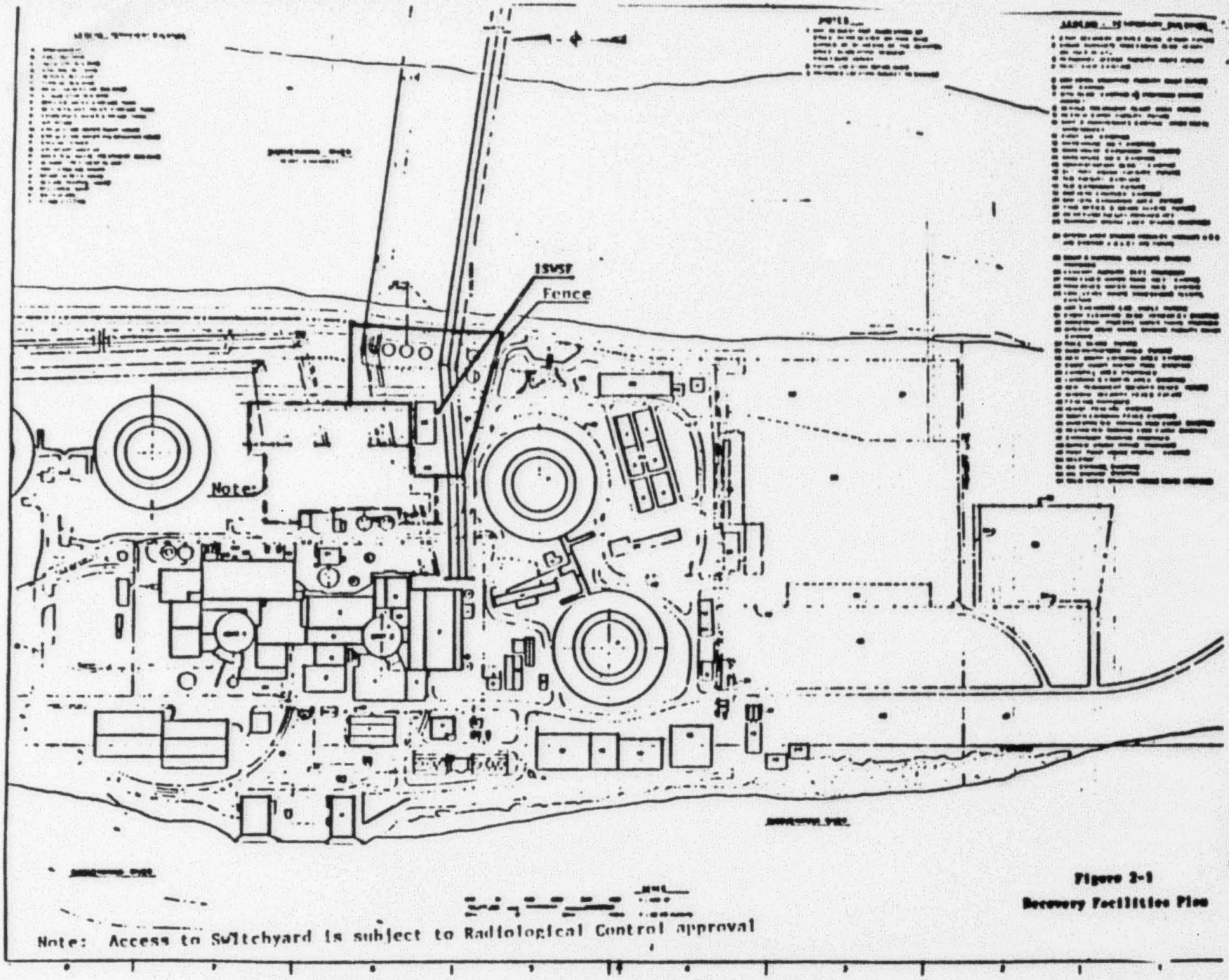
5.2 Unreviewed Safety Question

The operation of the ISWSF will not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report. This is based on the location of the facility being such that there is no interface with existing safety-related equipment or structures.

The possibility of an accident or malfunction of a different type than any evaluated previously in the safety analysis report will not be created by the operation of the ISWSF. This is due to the passive nature of the facility and the fact that all the radioactive material is in either a solid/solidified or fixed form.

As stated in Section 5.1, the operation of the ISWSF will not result in a reduction in the margin of safety as defined in the basis for any technical specification.

Based on the above, the operation of the ISWSF is deemed not to be an unreviewed safety question as defined in 10 CFR 50, paragraph 50.59.



Note: Access to Switchyard is subject to Radiological Control approval

Figure 2-1
Recovery Facilities Plan

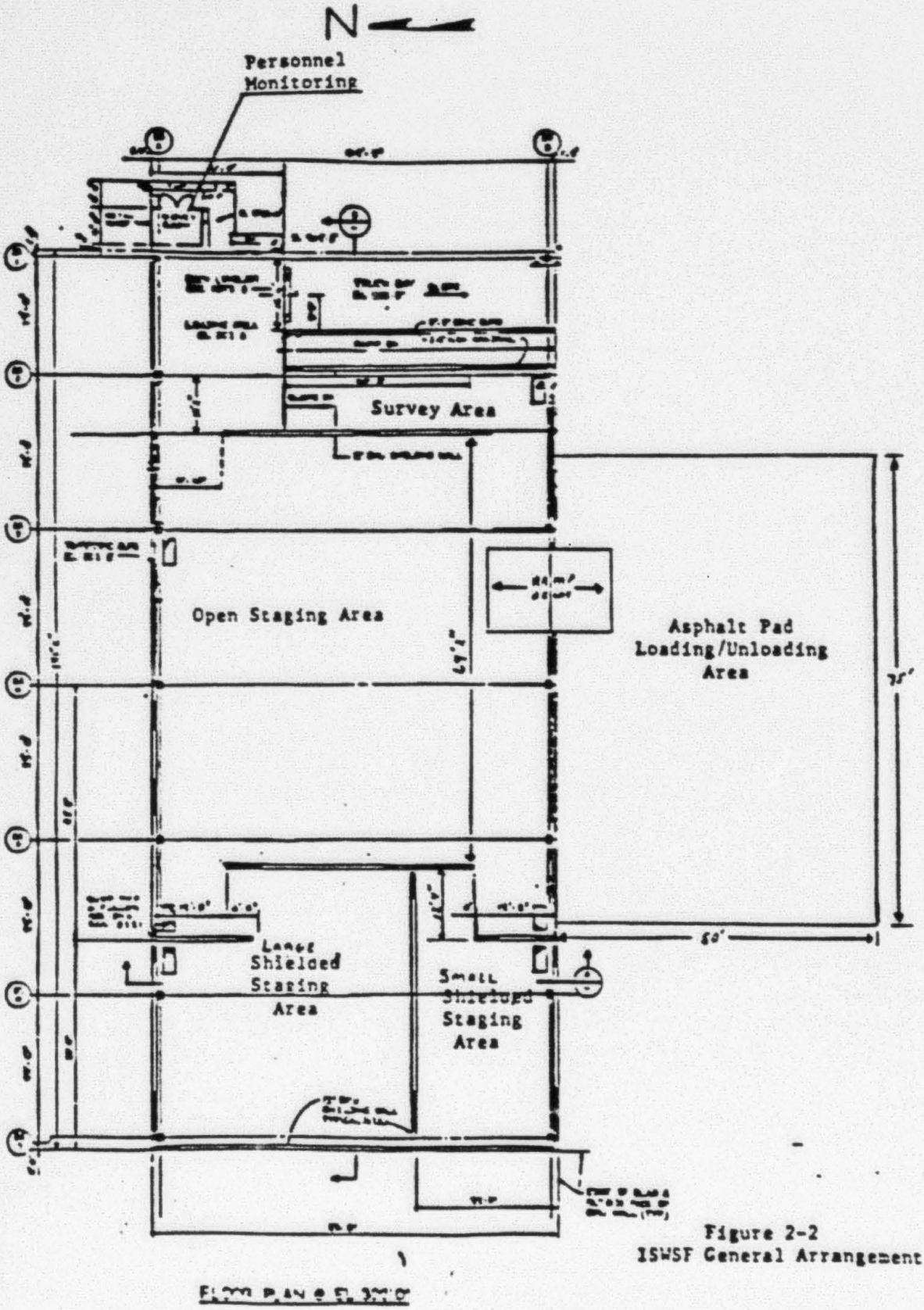


Figure 2-2
ISWSF General Arrangement