

# LGS UFSAR

## CHAPTER 9 - AUXILIARY SYSTEMS

### TABLE OF CONTENTS

|           |  |
|-----------|--|
| 9.1       | FUEL STORAGE AND HANDLING  |
| 9.1.1     | New Fuel Storage   |
| 9.1.1.1   | Design Bases   |
| 9.1.1.2   | Facility Description   |
| 9.1.1.3   | Safety Evaluation  |
| 9.1.2     | Spent Fuel Storage   |
| 9.1.2.1   | Design Bases   |
| 9.1.2.2   | Facility Description   |
| 9.1.2.2.1 | General Description  |
| 9.1.2.2.2 | Component Description  |
| 9.1.2.3   | Safety Evaluation  |
| 9.1.2.3.1 | Criticality Control  |
| 9.1.2.3.2 | Structural Analyses  |
| 9.1.2.3.3 | Installation of New Maximum Density Racks  |
| 9.1.2.4   | Tests and Inspections  |
| 9.1.2.4.1 | Deleted  |
| 9.1.2.4.2 | Deleted  |
| 9.1.2.4.3 | Test Coupon Description and Installation-Maximum Density Spent Fuel Storage Rack |
| 9.1.2.4.4 | Test Coupon Inspection-Maximum Density Spent Fuel Storage Rack                   |
| 9.1.3     | Fuel Pool Cooling and Cleanup System   |
| 9.1.3.1   | Design Bases   |
| 9.1.3.2   | System Description   |
| 9.1.3.2.1 | General Description  |
| 9.1.3.2.2 | Component Description  |
| 9.1.3.2.3 | System Operation   |
| 9.1.3.3   | Safety Evaluation  |
| 9.1.3.4   | Inspection and Testing Requirements  |
| 9.1.3.5   | Instrumentation Applications   |
| 9.1.3.6   | Analysis for Nonseismic Fuel Pool Cooling and Cleanup System                     |
| 9.1.4     | Fuel Handling System   |
| 9.1.4.1   | Design Bases   |
| 9.1.4.2   | System Description   |
| 9.1.4.2.1 | Spent Fuel Cask  |
| 9.1.4.2.2 | Cask Crane   |
| 9.1.4.2.3 | Fuel Servicing Equipment   |
| 9.1.4.2.4 | Servicing Aids   |
| 9.1.4.2.5 | Reactor Vessel Servicing Equipment   |
| 9.1.4.2.6 | In-Vessel Servicing Equipment  |
| 9.1.4.2.7 | Refueling Equipment  |
| 9.1.4.2.8 | Storage Equipment  |
| 9.1.4.2.9 | Under-Reactor Vessel Servicing Equipment   |

# LGS UFSAR

## TABLE OF CONTENTS (Cont'd)

|            |                                     |
|------------|-------------------------------------|
| 9.1.4.2.10 | Description of Fuel Transfer        |
| 9.1.4.3    | Safety Evaluation                   |
| 9.1.4.4    | Inspection and Testing Requirements |
| 9.1.4.4.1  | Inspection                          |
| 9.1.4.4.2  | Testing                             |
| 9.1.4.5    | Instrumentation Requirements        |
| 9.1.4.5.1  | Refueling Platform                  |
| 9.1.4.5.2  | Fuel Support Grapple                |
| 9.1.4.5.3  | Other Equipment                     |
| 9.1.4.5.4  | Radiation Monitoring                |
| 9.1.5      | Reactor Enclosure Crane             |
| 9.1.5.1    | Design Bases                        |
| 9.1.5.2    | Equipment Design                    |
| 9.1.5.3    | Loads                               |
| 9.1.5.4    | Safety Evaluation                   |
| 9.1.5.5    | Inspection and Testing              |
| 9.1.5.5.1  | Structural Members                  |
| 9.1.5.5.2  | Load-Bearing Components             |
| 9.1.5.5.3  | Hooks                               |
| 9.1.5.5.4  | Ropes                               |
| 9.1.5.5.5  | Performance and Acceptance Tests    |
| 9.1.6      | References                          |
| 9.2        | WATER SYSTEMS                       |
| 9.2.1      | Service Water System                |
| 9.2.1.1    | Design Bases                        |
| 9.2.1.2    | System Description                  |
| 9.2.1.3    | Safety Evaluation                   |
| 9.2.1.4    | Tests and Inspections               |
| 9.2.1.5    | Instrumentation Applications        |
| 9.2.2      | Emergency Service Water System      |
| 9.2.2.1    | Design Bases                        |
| 9.2.2.2    | System Description                  |
| 9.2.2.3    | Safety Evaluation                   |
| 9.2.2.4    | Tests and Inspections               |
| 9.2.2.5    | Instrumentation Applications        |
| 9.2.3      | RHR Service Water System            |
| 9.2.3.1    | Design Bases                        |
| 9.2.3.2    | System Description                  |
| 9.2.3.3    | Safety Evaluation                   |
| 9.2.3.4    | Tests and Inspections               |
| 9.2.3.5    | Instrumentation Applications        |
| 9.2.3.6    | Regulatory Commitments              |
| 9.2.4      | Clarified Water System              |

## LGS UFSAR

### TABLE OF CONTENTS (Cont'd)

|           |   |
|-----------|---|
| 9.2.4.1   | Design Bases  |
| 9.2.4.2   | System Description                                      |
| 9.2.4.3   | Safety Evaluation                                       |
| 9.2.4.4   | Testing and Inspection Requirements                     |
| 9.2.4.5   | Instrumentation Requirements                            |
| 9.2.5     | Demineralized Water Makeup System                       |
| 9.2.5.1   | Design Bases  |
| 9.2.5.2   | System Description                                      |
| 9.2.5.3   | Safety Evaluation                                       |
| 9.2.5.4   | Testing and Inspection Requirements                     |
| 9.2.5.5   | Instrumentation Requirements                            |
| 9.2.6     | Ultimate Heat Sink                                      |
| 9.2.6.1   | Design Bases  |
| 9.2.6.2   | System Description                                      |
| 9.2.6.2.1 | General Description                                     |
| 9.2.6.2.2 | Spray Pond Description                                  |
| 9.2.6.2.3 | Spray Pond Pump Structure                               |
| 9.2.6.2.4 | System Components                                       |
| 9.2.6.3   | System Operation  |
| 9.2.6.3.1 | Normal Operation  |
| 9.2.6.3.2 | Winter Operation  |
| 9.2.6.3.3 | Cooling Tower Operation                                 |
| 9.2.6.4   | Spray Pond Thermal Performance                          |
| 9.2.6.4.1 | Design Meteorology                                      |
| 9.2.6.4.2 | Spray Pond Water Requirements                           |
| 9.2.6.4.3 | Evaluation of UHS Performance                           |
| 9.2.6.5   | Safety Evaluation                                       |
| 9.2.6.5.1 | Thermal Performance                                     |
| 9.2.6.5.2 | Effects of Severe Natural Events or Site-Related Events |
| 9.2.6.5.3 | Freezing Considerations                                 |
| 9.2.6.5.4 | Other Considerations                                    |
| 9.2.6.6   | Conformance to Regulatory Guide 1.27                    |
| 9.2.6.7   | Instrumentation and Alarms                              |
| 9.2.6.8   | Tests and Inspections                                   |
| 9.2.7     | Condensate and Refueling Water Storage Facilities       |
| 9.2.7.1   | Design Bases  |
| 9.2.7.2   | System Description                                      |
| 9.2.7.2.1 | Condensate Storage Tanks (Units 1 and 2)                |
| 9.2.7.2.2 | Refueling Water Storage Tank                            |
| 9.2.7.3   | Safety Evaluation                                       |
| 9.2.7.4   | Tests and Inspections                                   |
| 9.2.7.5   | Instrumentation Applications                            |
| 9.2.7.5.1 | Condensate Storage Tanks                                |
| 9.2.7.5.2 | Refueling Water Storage Tank                            |

## LGS UFSAR

### TABLE OF CONTENTS (Cont'd)

|            |   |
|------------|---|
| 9.2.8      | Reactor Enclosure Cooling Water System          |
| 9.2.8.1    | Design Bases                                    |
| 9.2.8.2    | System Description                              |
| 9.2.8.3    | Safety Evaluation                               |
| 9.2.8.4    | Tests and Inspections                           |
| 9.2.8.5    | Instrumentation Applications                    |
| 9.2.9      | Turbine Enclosure Cooling Water System          |
| 9.2.9.1    | Design Bases                                    |
| 9.2.9.2    | System Description                              |
| 9.2.9.3    | Safety Evaluation                               |
| 9.2.9.4    | Tests and Inspections                           |
| 9.2.9.5    | Instrumentation Applications                    |
| 9.2.10     | Chilled Water Systems                           |
| 9.2.10.1   | Drywell Chilled Water System                    |
| 9.2.10.1.1 | Design Bases                                    |
| 9.2.10.1.2 | System Description                              |
| 9.2.10.1.3 | Safety Evaluation                               |
| 9.2.10.1.4 | Tests and Inspections                           |
| 9.2.10.1.5 | Instrumentation Applications                    |
| 9.2.10.2   | Control Structure Chilled Water System          |
| 9.2.10.2.1 | Design Bases                                    |
| 9.2.10.2.2 | System Description                              |
| 9.2.10.2.3 | Safety Evaluation                               |
| 9.2.10.2.4 | Tests and Inspections                           |
| 9.2.10.2.5 | Instrumentation Applications                    |
| 9.2.11     | References                                      |
| 9.3        | PROCESS AUXILIARIES                             |
| 9.3.1      | Compressed Air and Gas Systems                  |
| 9.3.1.1    | Station Air Systems                             |
| 9.3.1.1.1  | Design Bases                                    |
| 9.3.1.1.2  | System Description                              |
| 9.3.1.1.3  | Safety Evaluation                               |
| 9.3.1.1.4  | Tests and Inspections                           |
| 9.3.1.1.5  | Instrumentation Application                     |
| 9.3.1.2    | Perkiomen and Schuylkill Compressed Air Systems |
| 9.3.1.2.1  | Design Bases                                    |
| 9.3.1.2.2  | System Description                              |
| 9.3.1.2.3  | Safety Evaluation                               |
| 9.3.1.2.4  | Tests and Inspections                           |
| 9.3.1.2.5  | Instrumentation Application                     |
| 9.3.1.3    | Primary Containment Instrument Gas System       |
| 9.3.1.3.1  | Design Bases                                    |
| 9.3.1.3.2  | System Description                              |
| 9.3.1.3.3  | Safety Evaluation                               |
| 9.3.1.3.4  | Tests and Inspections                           |

## LGS UFSAR

### TABLE OF CONTENTS (Cont'd)

|           |  |
|-----------|--|
| 9.3.1.3.5 | Instrumentation Applications   |
| 9.3.2     | Process Sampling System  |
| 9.3.2.1   | Design Bases   |
| 9.3.2.2   | System Description   |
| 9.3.2.3   | Safety Evaluation  |
| 9.3.2.4   | Testing and Inspection   |
| 9.3.2.5   | Instrumentation Applications   |
| 9.3.3     | Plant Drainage Systems   |
| 9.3.3.1   | Design Bases   |
| 9.3.3.2   | System Description   |
| 9.3.3.2.1 | General Description  |
| 9.3.3.2.2 | Component Description  |
| 9.3.3.2.3 | System Operation   |
| 9.3.3.3   | Safety Evaluation  |
| 9.3.3.4   | Tests and Inspections  |
| 9.3.3.5   | Instrumentation Application  |
| 9.3.4     | Chemical and Volume Control System   |
| 9.3.5     | Standby Liquid Control System  |
| 9.3.5.1   | Design Bases   |
| 9.3.5.2   | System Description   |
| 9.3.5.3   | Safety Evaluation  |
| 9.3.5.4   | Testing and Inspection Requirements  |
| 9.3.5.5   | Instrumentation Requirements   |
| 9.3.6     | References   |
| 9.4       | HEATING, VENTILATION, AND AIR CONDITIONING SYSTEMS   |
| 9.4.1     | Control Room and Control Structure Ventilation Systems   |
| 9.4.1.1   | Control Room HVAC System   |
| 9.4.1.1.1 | Design Bases   |
| 9.4.1.1.2 | System Description   |
| 9.4.1.2   | Auxiliary Equipment Room HVAC System   |
| 9.4.1.2.1 | Design Bases   |
| 9.4.1.2.2 | System Description   |
| 9.4.1.3   | Emergency Fresh Air Supply System  |
| 9.4.1.3.1 | Design Bases   |
| 9.4.1.3.2 | System Description   |
| 9.4.1.4   | Control Structure HVAC Systems from Turbine Enclosure  |
| 9.4.1.4.1 | Design Bases   |
| 9.4.1.4.2 | System Description   |
| 9.4.1.5   | SGTS Equipment Compartment HVAC Systems  |
| 9.4.1.5.1 | Design Bases   |
| 9.4.1.5.2 | System Description   |
| 9.4.1.6   | Emergency Switchgear and Battery Compartments HVAC System and Battery<br>Compartments Exhaust System |

# LGS UFSAR

## TABLE OF CONTENTS (Cont'd)

|           |  |
|-----------|--|
| 9.4.1.6.1 | Design Bases   |
| 9.4.1.6.2 | System Description   |
| 9.4.1.7   | Safety Evaluation  |
| 9.4.1.8   | Tests and Inspections  |
| 9.4.1.9   | Instrumentation Requirements   |
| 9.4.2     | Reactor Enclosure and Refueling Area Ventilation Systems               |
| 9.4.2.1   | Reactor Enclosure and Refueling Area HVAC Systems for Normal Operation |
| 9.4.2.1.1 | Design Bases   |
| 9.4.2.1.2 | System Description   |
| 9.4.2.1.3 | Safety Evaluation  |
| 9.4.2.1.4 | Tests and Inspections  |
| 9.4.2.1.5 | Instrumentation Requirements   |
| 9.4.2.2   | Safety-Related Reactor Enclosure Air Cooling System                    |
| 9.4.2.2.1 | Design Bases   |
| 9.4.2.2.2 | System Description   |
| 9.4.2.2.3 | Safety Evaluation  |
| 9.4.2.2.4 | Tests and Inspections  |
| 9.4.2.2.5 | Instrumentation Requirements   |
| 9.4.3     | Radwaste Enclosure Ventilation System                                  |
| 9.4.3.1   | Design Bases   |
| 9.4.3.2   | System Description   |
| 9.4.3.2.1 | Radwaste General Areas   |
| 9.4.3.2.2 | Radwaste Equipment Compartments  |
| 9.4.3.2.3 | Radwaste Service and Control Area                                      |
| 9.4.3.2.4 | Chemistry Laboratory Expansion   |
| 9.4.3.2.5 | Fume Hoods   |
| 9.4.3.2.6 | Charcoal Tank Vaults   |
| 9.4.3.3   | Safety Evaluation  |
| 9.4.3.4   | Tests and Inspections  |
| 9.4.3.5   | Instrumentation Requirements   |
| 9.4.4     | Turbine Enclosure Ventilation System                                   |
| 9.4.4.1   | Design Bases   |
| 9.4.4.2   | System Description   |
| 9.4.4.2.1 | Supply System (V101)   |
| 9.4.4.2.2 | Unit Coolers   |
| 9.4.4.2.3 | Unit Heaters   |
| 9.4.4.2.4 | Return/Exhaust Air System (V105)                                       |
| 9.4.4.2.5 | Equipment Compartment Exhaust System (V106)                            |
| 9.4.4.2.6 | Battery Compartment Exhaust Fan (V108)                                 |
| 9.4.4.3   | Safety Evaluation  |
| 9.4.4.4   | Tests and Inspections  |
| 9.4.4.5   | Instrumentation Requirements   |
| 9.4.5     | Primary Containment Ventilation System                                 |
| 9.4.5.1   | Containment Atmospheric Control System                                 |
| 9.4.5.1.1 | Design Bases   |
| 9.4.5.1.2 | System Description   |

## LGS UFSAR

### TABLE OF CONTENTS (Cont'd)

|            |   |
|------------|---|
| 9.4.5.1.3  | Safety Evaluation                             |
| 9.4.5.1.4  | Tests and Inspections                         |
| 9.4.5.1.5  | Instrumentation Applications                  |
| 9.4.5.2    | Drywell Air Cooling System                    |
| 9.4.5.2.1  | Design Bases                                  |
| 9.4.5.2.2  | System Description                            |
| 9.4.5.2.3  | Safety Evaluation                             |
| 9.4.5.2.4  | Tests and Inspections                         |
| 9.4.5.2.5  | Instrumentation Applications                  |
| 9.4.6      | Diesel Generator Enclosure Ventilation System |
| 9.4.6.1    | Design Bases                                  |
| 9.4.6.2    | System Description                            |
| 9.4.6.3    | Safety Evaluation                             |
| 9.4.6.4    | Tests and Inspections                         |
| 9.4.6.5    | Instrumentation Requirements                  |
| 9.4.7      | Spray Pond Pump Structure Ventilation System  |
| 9.4.7.1    | Design Bases                                  |
| 9.4.7.2    | System Description                            |
| 9.4.7.3    | Safety Evaluation                             |
| 9.4.7.4    | Tests and Inspections                         |
| 9.4.7.5    | Instrumentation Requirements                  |
| 9.4.8      | Hot Maintenance Shop Ventilation System       |
| 9.4.8.1    | Design Bases                                  |
| 9.4.8.2    | System Description                            |
| 9.4.8.2.1  | Hot Shop Supply and Return System             |
| 9.4.8.2.2  | Fume and Particle Removal System              |
| 9.4.8.2.3  | Exhaust System                                |
| 9.4.8.2.4  | Refrigeration System                          |
| 9.4.8.3    | Safety Evaluation                             |
| 9.4.8.4    | Tests and Inspections                         |
| 9.4.8.5    | Instrumentation Requirements                  |
| 9.4.9      | Miscellaneous Structures Ventilation Systems  |
| 9.4.9.1    | Design Bases                                  |
| 9.4.9.2    | System Description                            |
| 9.4.9.2.1  | Circulating Water Pump Structure              |
| 9.4.9.2.2  | Water Treatment Enclosure                     |
| 9.4.9.2.3  | Sewage Treatment Enclosure                    |
| 9.4.9.2.4  | Schuylkill River Pump Structure               |
| 9.4.9.2.5  | Perkiomen Creek Pump Structure                |
| 9.4.9.2.6  | Boiler Fuel Oil Transfer Enclosure            |
| 9.4.9.2.7  | Auxiliary Boiler Enclosure                    |
| 9.4.9.2.8  | Lube Oil Structure                            |
| 9.4.9.2.9  | Chlorine and Acid Feed Enclosure              |
| 9.4.9.2.10 | Administration Building                       |
| 9.4.9.3    | Safety Evaluation                             |
| 9.4.9.4    | Tests and Inspections                         |
| 9.4.9.5    | Instrumentation Requirements                  |

# LGS UFSAR

## TABLE OF CONTENTS (Cont'd)

|            |  |
|------------|--|
| 9.5        | OTHER AUXILIARY SYSTEMS                            |
| 9.5.1      | Fire Protection Program                            |
| 9.5.1.1    | Design Basis                                       |
| 9.5.1.2    | System Description                                 |
| 9.5.1.2.1  | Facility Features for Fire Prevention              |
| 9.5.1.2.2  | Fire Protection Water Supply Systems               |
| 9.5.1.2.3  | Automatic Sprinkler Systems                        |
| 9.5.1.2.4  | Wet Standpipes                                     |
| 9.5.1.2.5  | Foam Extinguishing System                          |
| 9.5.1.2.6  | Deleted  |
| 9.5.1.2.7  | Halon Extinguishing Systems                        |
| 9.5.1.2.8  | Portable Fire Extinguishers                        |
| 9.5.1.2.9  | Fire and Smoke Detection System                    |
| 9.5.1.2.10 | Emergency Lighting                                 |
| 9.5.1.2.11 | Communication System                               |
| 9.5.1.2.12 | Area Fire Protection Provisions                    |
| 9.5.1.3    | Safety Evaluation                                  |
| 9.5.1.4    | Inspection and Testing Requirements                |
| 9.5.1.4.1  | Preoperational Testing                             |
| 9.5.1.4.2  | Operational Testing and Inspection                 |
| 9.5.1.5    | Personnel Qualification and Training               |
| 9.5.2      | Communication Systems                              |
| 9.5.2.1    | Design Bases                                       |
| 9.5.2.2    | System Description                                 |
| 9.5.2.2.1  | Intrplant Public Address System                    |
| 9.5.2.2.2  | Private Automatic Branch Exchange Telephone System |
| 9.5.2.2.3  | Intrplant Maintenance Telephone System             |
| 9.5.2.2.4  | Evacuation Alarm and River Warning System          |
| 9.5.2.2.5  | In-Plant Radio System                              |
| 9.5.2.2.6  | Radio Communication                                |
| 9.5.2.3    | Safety Evaluation                                  |
| 9.5.2.4    | Inspection and Testing Requirements                |
| 9.5.3      | Lighting System                                    |
| 9.5.3.1    | Design Bases                                       |
| 9.5.3.2    | System Description                                 |
| 9.5.3.2.1  | Normal Lighting                                    |
| 9.5.3.2.2  | Emergency Lighting                                 |
| 9.5.3.2.3  | Outdoor Security and Roadway Lighting              |
| 9.5.3.3    | Safety Evaluation                                  |
| 9.5.3.4    | Inspection and Testing Requirements                |
| 9.5.4      | Diesel Generator Fuel Oil System                   |
| 9.5.4.1    | Design Bases                                       |
| 9.5.4.2    | System Description                                 |
| 9.5.4.3    | Safety Evaluation                                  |

## LGS UFSAR

### TABLE OF CONTENTS (Cont'd)

|           |   |
|-----------|---|
| 9.5.4.4   | Tests and Inspections                                     |
| 9.5.4.5   | Instrument Applications                                   |
| 9.5.5     | Diesel Generator Cooling Water System                     |
| 9.5.5.1   | Design Bases  |
| 9.5.5.2   | System Description  |
| 9.5.5.2.1 | Jacket Water Cooling Loop                                 |
| 9.5.5.2.2 | Air Cooler Coolant Loop                                   |
| 9.5.5.3   | Safety Evaluation   |
| 9.5.5.4   | Tests and Inspections                                     |
| 9.5.5.5   | Instrument Applications                                   |
| 9.5.6     | Diesel Generator Starting System                          |
| 9.5.6.1   | Design Bases  |
| 9.5.6.2   | System Description  |
| 9.5.6.3   | Safety Evaluation   |
| 9.5.6.4   | Tests and Inspections                                     |
| 9.5.6.5   | Instrument Applications                                   |
| 9.5.7     | Diesel Generator Lubrication System                       |
| 9.5.7.1   | Design Bases  |
| 9.5.7.2   | System Description  |
| 9.5.7.3   | Safety Evaluation   |
| 9.5.7.4   | Tests and Inspections                                     |
| 9.5.7.5   | Instrument Application                                    |
| 9.5.8     | Diesel Generator Combustion Air Intake and Exhaust System |
| 9.5.8.1   | Design Bases  |
| 9.5.8.2   | System Description  |
| 9.5.8.3   | Safety Evaluation   |
| 9.5.8.4   | Tests and Inspections                                     |
| 9.5.8.5   | Instrument Application                                    |
| 9.5.9     | REFERENCES  |

# LGS UFSAR

## CHAPTER 9 - AUXILIARY SYSTEMS

### LIST OF TABLES

| <u>TABLE</u> | <u>TITLE</u>  |
|--------------|---|
| 9.1-1        | Fuel Pool Cooling and Cleanup System Design Parameters  |
| 9.1-2A       | Fuel Pool Cooling System Heat Removal Capacity and Makeup Requirements - Original Design                              |
| 9.1-2B       | Fuel Pool Cooling System Heat Removal Capacity and Makeup Requirements - Increased Storage Capacity                   |
| 9.1-3        | Fuel Pool Cooling System Failure Modes and Effects Analysis   |
| 9.1-4        | Results of Spent Fuel Pool (SFP) Boiling Analysis   |
| 9.1-5        | Decay Heat and Evaporation Rates for Loss of Spent Fuel Cooling   |
| 9.1-6        | Tools and Servicing Equipment   |
| 9.1-7        | Fuel Servicing Equipment  |
| 9.1-8        | Reactor Vessel Servicing Equipment  |
| 9.1-9        | Under-Reactor Vessel Servicing Equipment and Tools  |
| 9.1-10       | Reactor Enclosure Crane Design Parameters   |
| 9.1-11       | Reactor Enclosure Crane Failure Modes and Effects Analysis  |
| 9.1-12       | Comparison with NRC Regulatory Guide 1.104 (February 1976) - Overhead Crane Handling Systems for Nuclear Power Plants |
| 9.1-13       | Unit 1 Spent Fuel Storage Rack Modules  |
| 9.1-14       | Spent Fuel Pool Materials   |
| 9.1-15       | Deleted   |
| 9.1-16       | Deleted   |
| 9.1-17       | Deleted   |
| 9.1-18       | Deleted   |
| 9.1-19       | Deleted   |

# LGS UFSAR

## LIST OF TABLES (cont'd)

| <u>TABLE</u> | <u>TITLE</u>   |
|--------------|--|
| 9.1-20       | Deleted  |
| 9.1-21       | Spent Fuel Racks, Applicable Codes and Standards   |
| 9.1-22       | Compliance with ANS 57.1 for Reactor Enclosure Crane   |
| 9.1-23       | Sizes and Weights of Maximum Density Spent Fuel Storage Racks                                      |
| 9.1-24       | Reference Case, Maximum Density Spent Fuel Storage Rack, Input Parameters                          |
| 9.1-25       | Maximum Density Spent Fuel Storage Rack, Effect of Temperature and Void on Reactivity              |
| 9.1-26       | Maximum Density Spent Fuel Storage Racks, Reactivity Uncertainties Due to Manufacturing Tolerances |
| 9.1-27       | Maximum Density Spent Fuel Storage Racks, Summary of $K_{\infty}$ for Various Fuel Types           |
| 9.1-28       | Maximum Density Spent Fuel Storage Racks, Summary of Critically Safety Analyses                    |
| 9.1-29       | Maximum Density Spent Fuel Storage Rack Material Data  |
| 9.1-30       | Load Combinations and Allowable Stresses - Maximum Density Spent Fuel Storage Rack                 |
| 9.1-31       | Summary of Whole Pool Multi-Rack Analyses  |
| 9.1-32       | Deleted  |
| 9.2-1        | Service Water System Design Parameters   |
| 9.2-2        | Emergency Service Water System Design Parameters   |
| 9.2-3        | Emergency Service Water System Design Flows and Heat Transfer Rates per Loop                       |
| 9.2-4        | Emergency Service Water System Failure Modes and Effects Analysis                                  |
| 9.2-5        | Residual Heat Removal Service Water System Design Parameters                                       |
| 9.2-6        | RHR Service Water System Failure Modes and Effects Analysis  |
| 9.2-7        | Clarified and Domestic Water Systems Design Parameters   |
| 9.2-8        | Demineralized Water Makeup System Design Parameters  |

# LGS UFSAR

## LIST OF TABLES (cont'd)

| <u>TABLE</u> | <u>TITLE</u>  |
|--------------|---|
| 9.2-9        | Spray Pond Design Data  |
| 9.2-10       | Percent Frequency Distribution of Daily Average Relative Humidity and Wind Speed  |
| 9.2-11       | Spray Pond System Design Meteorology  |
| 9.2-12       | Coefficient of Thermal Performance, Comparison of LGS and Philadelphia Worst Case Meteorological Conditions (January 1, 1972 - December 31, 1976) |
| 9.2-13       | Summary of Spray Pond Water Allowances  |
| 9.2-14       | Data Used in Performance Analyses   |
| 9.2-15       | Heat Rejection Rate to the Spray Pond (Two Unit SSD)  |
| 9.2-16       | Integrated Heat Rejection to the Spray Pond (Two Unit SSD)  |
| 9.2-17       | Spray Pond Temperature Transient (Two Unit SSD)   |
| 9.2-18       | Size Comparison of Rancho Seco and Limerick Spray Ponds   |
| 9.2-19       | Performance Comparison of Rancho Seco Test Results and Model Results  |
| 9.2-20       | Condensate and Refueling Water Storage Facilities Design Parameters   |
| 9.2-21       | Reactor Enclosure Cooling Water System Design Parameters  |
| 9.2-22       | Turbine Enclosure Cooling Water System Design Parameters  |
| 9.2-23       | Drywell Chilled Water System Design Parameters  |
| 9.2-24       | Control Structure Chilled Water System Design Parameters  |
| 9.2-25       | Control Structure Chilled Water System Failure Modes and Effects Analysis   |
| 9.3-1        | Station Air Systems Design Parameters   |
| 9.3-2        | Perkiomen and Schuylkill Compressed Air Systems Design Parameters   |
| 9.3-3        | Primary Containment Instrument Gas System Design Parameters   |
| 9.3-4        | Safety-Related Pneumatically-Operated Valves and Dampers  |
| 9.3-5        | Plant Drainage Systems Component Description  |
| 9.3-6        | Standby Liquid Control System Operating Pressure/Temperature Conditions   |

# LGS UFSAR

## LIST OF TABLES (cont'd)

| <u>TABLE</u> | <u>TITLE</u>   |
|--------------|--|
| 9.4-1        | Control Room and Control Structure Ventilation System Equipment Design Parameters        |
| 9.4-2        | Control Room HVAC System Isolation Valve Design Parameters                               |
| 9.4-3        | Control Room and Control Structure Ventilation System Failure Mode and Effect Analysis   |
| 9.4-4        | Ventilation Systems Tests and Inspections  |
| 9.4-5        | Reactor Enclosure and Refueling Area Ventilation Systems Design Parameters               |
| 9.4-6        | Reactor Enclosure Safety-Related Air Cooling System Design Parameters                    |
| 9.4-7        | Reactor Enclosure Ventilation System Failure Modes and Effects Analysis                  |
| 9.4-8        | Radwaste Enclosure Ventilation System Equipment Design Parameters                        |
| 9.4-9        | Turbine Enclosure Ventilation System Equipment Design Parameters                         |
| 9.4-10       | Drywell Unit Cooler Design Parameters  |
| 9.4-11       | Primary Containment Ventilation System Failure Modes and Effects Analysis                |
| 9.4-12       | Diesel Generator Enclosure Ventilation System Equipment Design Parameters                |
| 9.4-13       | Diesel Generator Enclosure Ventilation System Failure Modes and Effects Analysis         |
| 9.4-14       | Spray Pond Pump Structure Ventilation System Equipment Design Parameters                 |
| 9.4-15       | Spray Pond Pump Structure Ventilation System Failure Modes and Effects Analysis          |
| 9.4-16       | Hot Maintenance Shop Ventilation System Equipment Design Parameters                      |
| 9.4-17       | Miscellaneous Structures Ventilation System Equipment Design Parameters                  |
| 9.4-18       | Conformance with Regulatory Guide 1.140  |
| 9.5-1        | National Fire Protection Association Standards Used in Design of Fire Protection Systems |
| 9.5-2        | Insulation and Jacketing Materials Used for Electrical Cabling                           |
| 9.5-3        | Diesel Generator Fuel Oil System Design Parameters                                       |

## LGS UFSAR

### LIST OF TABLES (cont'd)

| <u>TABLE</u> | <u>TITLE</u>   |
|--------------|--|
| 9.5-4        | Diesel Generator Fuel Oil System Failure Modes and Effects Analysis                          |
| 9.5-5        | Diesel Generator Jacket Water Cooling Loop Design Parameters                                 |
| 9.5-6        | Diesel Generator Air Cooler Coolant Loop Design Parameters                                   |
| 9.5-7        | Diesel Generator Starting System Design Parameters   |
| 9.5-8        | Diesel Generator Starting System Failure Modes and Effects Analysis                          |
| 9.5-9        | Diesel Generator Lubrication System Design Parameters  |
| 9.5-10       | Diesel Generator Combustion Air Intake and Exhaust System Design Parameters                  |
| 9.5-11       | Diesel Generator Combustion Air Intake and Exhaust System Failure Modes and Effects Analysis |
| 9.5-12       | Lighting System Intensities of Illumination  |
| 9.5-13       | Remote Emergency Shutdown Locations, Intensities of Illumination (foot candles)              |

# LGS UFSAR

## CHAPTER 9 - AUXILIARY SYSTEMS

### LIST OF FIGURES

| <u>FIGURE</u> | <u>TITLE</u>  |
|---------------|---|
| 9.1-1         | Intentionally Left Blank  |
| 9.1-2         | Deleted   |
| 9.1-3         | Deleted   |
| 9.1-4         | Deleted   |
| 9.1-5         | Fuel Preparation Machine Shown Installed in Facsimile Fuel Pool                           |
| 9.1-6         | New Fuel Inspection Stand (Deleted)   |
| 9.1-7         | Channel Bolt Wrench   |
| 9.1-8         | Channel Handling Tool   |
| 9.1-9         | Fuel Pool Sipper  |
| 9.1-10        | Fuel Inspection Fixture   |
| 9.1-11        | Channel Gauging Fixture   |
| 9.1-12        | General Purpose Grapple   |
| 9.1-13        | Refueling Outage Flow Diagram (Deleted)   |
| 9.1-14        | Simplified Section of New Fuel Handling Facilities (Section X-X, Figure 9.1-17) (Deleted) |
| 9.1-15        | Simplified Section of Refueling Facilities (Section Y-Y, Figure 9.1-17) (Deleted)         |
| 9.1-16        | Simplified Section of Fuel Shipping Facilities (Section Z-Z, Figure 9.1-17) (Deleted)     |
| 9.1-17        | Deleted   |
| 9.1-18        | Reactor Enclosure Crane Trolley Layout  |
| 9.1-19        | Reactor Enclosure Crane Main Hoist Reeving System   |
| 9.1-20        | Reactor Enclosure Crane Auxiliary Hoist Reeving System                                    |

## LGS UFSAR

### LIST OF FIGURES (cont'd)

| <u>FIGURES</u> | <u>TITLE</u>   |
|----------------|--|
| 9.1-21         | Reactor Enclosure Crane Equalizer Assembly   |
| 9.1-22         | Reactor Enclosure Crane Main Hoist Redundant Hook  |
| 9.1-23         | Reactor Enclosure Crane Load Block Assembly  |
| 9.1-24         | Reactor Enclosure Crane Restricted Area  |
| 9.1-25         | Deleted  |
| 9.1-26         | Deleted  |
| 9.1-27         | Deleted  |
| 9.1-28         | Deleted  |
| 9.1-29         | Deleted  |
| 9.1-30         | Deleted  |
| 9.1-31         | Deleted  |
| 9.1-32         | Deleted  |
| 9.1-33         | Deleted  |
| 9.1-34         | Unit 1 Fuel Pool Initial Layout  |
| 9.1-35         | Unit 1 Fuel Pool Layout for Maximum Capacity   |
| 9.1-36         | Unit 2 Fuel Pool Initial Layout  |
| 9.1-37         | Unit 2 Fuel Pool Layout for Maximum Capacity   |
| 9.1-38         | Deleted  |
| 9.1-39         | Deleted  |
| 9.1-40         | Spent Fuel Pool Liner Leakage Detection System Typical Drainage Path for Enclosure Walls |
| 9.1-41         | Maximum Density Spent Fuel Storage Racks   |
| 9.1-42         | Maximum Density Spent Fuel Cavity Geometry   |
| 9.1-43         | Maximum Density Spent Fuel Storage Rack, Schematic Model                                 |

## LGS UFSAR

### LIST OF FIGURES (cont'd)

| <u>FIGURES</u> | <u>TITLE</u>   |
|----------------|--|
| 9.1-44         | Maximum Density Spent Fuel Storage Rack, Dynamic Models                                    |
| 9.1-45         | Maximum Density Spent Fuel Storage Rack, 2-D Model   |
| 9.1-46         | Deleted  |
| 9.1-47         | Unit 2 Whole Pool Multi-Rack Model   |
| 9.2-1          | Deleted  |
| 9.2-2          | Deleted  |
| 9.2-3          | Deleted  |
| 9.2-4          | Deleted  |
| 9.2-5          | Deleted  |
| 9.2-6          | Spray Pond General Arrangement   |
| 9.2-7          | Deleted  |
| 9.2-8          | Cumulative Distribution of 24-Hour Mean Temperature in the 90-100% Relative Humidity Class |
| 9.2-9          | Cumulative Distribution of 24-Hour Mean Temperatures in the <50% Relative Humidity Class   |
| 9.2-10         | Schematic of Typical Loci Used in Spray Pond Drift Loss Analysis                           |
| 9.2-11         | Drag Force Approximation Used for Spray Pond Drift Loss Model                              |
| 9.2-12         | Spray Pond Droplet Trajectory Parameters   |
| 9.2-13         | Drift Loss Versus Nozzle Distance from Spray Pond Perimeter                                |
| 9.2-14         | Typical Drift Loss as a Function of Wind Speed   |
| 9.2-15         | Schematic of Heat Rejection to Spray Pond (Time < 30 Hours)                                |
| 9.2-16         | Schematic of Heat Rejection to Spray Pond (Time > 30 Hours)                                |
| 9.2-17         | Spray Pond Thermal Efficiency  |
| 9.2-18         | Heat Rejection Rate to the Spray Pond  |
| 9.2-19         | Integrated Heat Rejection to Spray Pond  |

# LGS UFSAR

## LIST OF FIGURES (cont'd)

| <u>FIGURES</u> | <u>TITLE</u>  |
|----------------|---|
| 9.2-20         | Spray Pond Model Diagram: No Natural Convection       |
| 9.2-21         | Spray Pond Model Diagram: Natural Convection Only     |
| 9.2-22         | Spray Pond Incremental Mass and Energy Flow Schematic |
| 9.2-23         | Spray Pond Temperature Transient                      |
| 9.2-24         | Deleted   |
| 9.2-25         | Deleted   |
| 9.2-26         | Deleted   |
| 9.2-27         | Deleted   |
| 9.2-28         | Deleted   |
| 9.2-29         | Deleted   |
| 9.3-1          | Deleted   |
| 9.3-2          | Deleted   |
| 9.3-3          | Deleted   |
| 9.3-4          | Deleted   |
| 9.3-5          | Deleted   |
| 9.3-6          | INTENTIONALLY LEFT BLANK                              |
| 9.3-7          | Saturation Temperature of Sodium Pentaborate Solution |
| 9.3-8          | Yard-Work Sanitary Sewer System                       |
| 9.3-9          | Sewage Treatment Facilities Equipment Installation    |
| 9.4-1          | Deleted   |
| 9.4-2          | Deleted   |
| 9.4-3          | Deleted   |
| 9.4-4          | Deleted   |
| 9.4-5          | Deleted   |

# LGS UFSAR

## LIST OF FIGURES (cont'd)

| <u>FIGURES</u> | <u>TITLE</u>                                      |
|----------------|---|
| 9.4-6          | Primary Containment Vacuum Relief Valve Schematic |
| 9.4-7          | Deleted   |
| 9.4-8          | Drywell Air Cooling System Layout                 |
| 9.4-9          | Deleted   |
| 9.4-10         | Deleted   |
| 9.4-11         | Deleted   |
| 9.4-12         | Control Structure Exhaust Air Discharge           |
| 9.5-1          | Deleted   |
| 9.5-2          | Deleted   |
| 9.5-3          | Deleted   |
| 9.5-4          | Deleted   |
| 9.5-5          | Deleted   |
| 9.5-6          | Deleted   |
| 9.5-7          | Deleted   |
| 9.5-8          | Deleted   |
| 9.5-9          | Deleted   |
| 9.5-10         | Deleted   |
| 9.5-11         | Deleted   |
| 9.5-12         | Deleted   |