

# RISK PROFILE



## FACILITIES – Plant/Systems Failure

Plant/systems failure is the failure of critical systems/equipment. A critical system is any system whose 'failure' could threaten human life, the system's environment or the organization which operates the system. Examples include:

- Failure or impairment of fire suppression systems;
- Water leaks/flooding/contamination;
- Sump pump failure;
- Heating, ventilation and air conditioning (HVAC) systems impairment/failure;
- Boiler/water heater failure;
- Electrical infrastructure (including transformers and switchgear) issues;
- Fuel tank leaks;
- Emergency power systems (generator) failure;
- Telecommunication systems issues;
- Medical gas delivery concerns;
- Aging infrastructure;
- Elevator failure, etc.

This document contains information entered by HIROC subscriber healthcare organizations (acute and non-acute) in the Risk Register application to help you in your assessment of this risk.



### Ranking / Ratings<sup>1</sup>

- Likelihood – average score 2.64
- Impact – average score 3.46

**The Risk Register allows for risks to be assessed on a five-point likelihood and impact scale, with five being the highest.**



### Key Controls / Mitigation Strategies

- General
  - ✓ Comprehensive hospital emergency code procedures in place (code response teams)
  - ✓ Emergency numbers posted to call during 'non-business' hours
  - ✓ Staff are well trained in what to do during an emergency situation (staff roles and responsibilities)
  - ✓ Staff orientation and training
  - ✓ Emergency Plan Manual
  - ✓ Disaster Recovery/Emergency Recovery Plan/Business Continuity Plan in place
  - ✓ Root cause analysis (RCA) and/or failure mode and effects analysis done on any critical events
  - ✓ Request for service ticketing system
  - ✓ Service agreements with host hospitals
  - ✓ Supply chain agreements
  - ✓ Adequate insurance policy in place
- Power Supply
  - ✓ Back-up generators/dual transformers/emergency power (red electrical outlets) for all critical equipment and systems e.g. uninterrupted power supply (UPS) for information systems
  - ✓ Multiple back-up units with separate feeds
  - ✓ Preventive maintenance program in place for all generators
  - ✓ Alternate/adequate fuel supply for generators maintained on site

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- ✓ Fuel supplier contracted to provide service should the fuel supply need to be replenished for the generator
- ✓ Hierarchy of equipment utilized with generator supply
- ✓ Contact numbers for the electrical utility provider to provide updates on the situation and ETA (estimated time of arrival) for repairs
- ✓ Agreements have been made with vendor to provide a portable generator and electrician if the facility generator fails
- ✓ Contractors on call 24/7 to service
- ✓ Engineer on call responds to all power generating situations
- ✓ Consider installation of transfer switch allowing the use of chillers during power outages
- ✓ Hangar doors can be opened via small generator or manually (to continue service)
- Medical Gas Source/Delivery
  - ✓ Crisis escalation procedures in place
  - ✓ Multiple system redundancies
  - ✓ Emergency back-up medical gas manifolds in critical care areas
  - ✓ Back-up oxygen system for source failure external to building
  - ✓ Standby oxygen and medical air cylinders for localized system failures
  - ✓ Oxygen, medical air and vacuum failure policy and procedure
  - ✓ Portable suction units available in the event of vacuum failure
  - ✓ Preventive maintenance plan for all suction pumps and medical gas outlets
  - ✓ Annual inspection is done on oxygen and suction by manufacturer to change filters and oil to ensure compliance to obtain certification
  - ✓ Bracket system to minimize outlet leaks
  - ✓ Respiratory therapist on call for emergencies
  - ✓ Partnership between respiratory therapy and plan operations
  - ✓ Alarm systems in place across the hospital
  - ✓ Space banks of oxygen are onsite to ensure constant supply
  - ✓ Education provided on an annual basis
- Aging Infrastructure
  - ✓ Regular preventive maintenance and testing of systems to observe performance and ensure functionality
  - ✓ Comprehensive corrective and preventive maintenance program to deal with failing infrastructure and equipment
  - ✓ Capital planning for replacement of aging facilities, equipment
  - ✓ Dedicated funds allocated for upgrades of aging infrastructure
  - ✓ Continuous efforts to apply for grants and funded infrastructure projects
  - ✓ Pipe replacement (galvanized iron pipe to steel pipe)
  - ✓ Transitioning from aging telephone 'PBX' (private branch exchange) to digital lines
  - ✓ Repair any localized leaking areas (roof)
  - ✓ Asset Management policies and procedures
  - ✓ Maintenance of asset control system including an asset count and critical asset rating
  - ✓ Maintenance vulnerability assessment completed
  - ✓ Policies and procedures for the utilization of the Computerized Maintenance Management System (CMMS) and the maintenance supporting software
  - ✓ Registering assets on the CMMS with appropriate preventive maintenance tasks and frequencies for all major equipment
- Water/Steam
  - ✓ Standard operating procedure in place for water/steam loss
  - ✓ Building automation system is integrated with building operator pager
  - ✓ Domestic water isolation valves used to provide flow logic (selecting one flow path versus another) for maintenance or safety

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- ✓ Technical Standards and Safety Authority (TSSA) inspection annually
- ✓ Replacement of boiler system from wing-wide temperature control to room-specific temperature control
- ✓ Preventive maintenance/inspection procedures in place for boilers and tanks
- ✓ Sites staffed 24/7 with Power Engineers for first response
- ✓ Scheduled preventive maintenance checks for grounds and checks/preparation performed on advisory of pending weather events
- ✓ Chemical treatment of water towers
- ✓ Instantaneous hot water heaters
- ✓ Semiannual disinfection and cleaning of ice machines
- ✓ Personal Protection Equipment (PPE) required by staff accessing cooling towers
- ✓ Contractors on call to service building
- ✓ The city Public Works department can be accessed for an update on circumstances if it is due to city infrastructure
- ✓ Supply of bottled water at each site for cooking and drinking
- ✓ Nursing staff have access to moist wipes to care for Residents and Patients
- ✓ Linen and dry food supply are sufficient to provide for Residents and Patients if water is not available
- ✓ Ensure snow is removed from the flat roof
- ✓ Annual orientation for mechanics on location of valves and how to shut off
- ✓ Mitigation plan developed in collaboration with property insurer
- Fire Suppression
  - ✓ Fire pump maintenance
  - ✓ Annual fire education
  - ✓ Facility signage
  - ✓ One-on-one training for charge nurses
  - ✓ Meet fire regulations
  - ✓ Fire panel and floor plan match
  - ✓ Fire alarm system is under maintenance contract and is serviced regularly
  - ✓ Fire monitoring systems in place at all sites
  - ✓ Fire sprinkler systems in place at all sites
- Heating, Ventilation and Air Conditioning (HVAC) Systems
  - ✓ Contractors on call 24/7 to repair HVAC system
  - ✓ Preventative maintenance checks completed regularly
  - ✓ Portable fans for the hallways to keep the air circulating
  - ✓ Facility has primary and secondary heating system to maintain heat in building
  - ✓ Extra blankets and linen on hand should the temperature fall below 22 degrees
  - ✓ Alarm systems in place to alert when systems stop running
- Elevator Systems
  - ✓ Elevator contractor is available 24/7 to answer calls
  - ✓ Emergency call feature in each elevator that passengers can access for help
  - ✓ Staff members are instructed to check for any passengers if an elevator is not working
  - ✓ Policy for elevator failure and entrapment
- Negative Air Flow Rooms
  - ✓ Weekly maintenance of negative air flow rooms completed by contractors
  - ✓ Pre-use check sheets available for staff, and instructions on entry provided to staff

## FACILITIES – Plant/Systems Failure



### Monitoring / Indicators

- General
  - Strict monitoring of the environment and facility conditions
  - Audit records kept per legislation requirements
  - Maintenance activities
  - Incident reports and tracking of equipment failures
  - Capital Planning requests
  - Downtime and event debriefs
  - Codes tracking and debriefing
  - Staff feedback at team meetings (standing agenda item)
  - Monthly safety checks and inspections
  - Annual review of insurance policy
- Water/Steam
  - Organizational reporting system to report stained tiles or water leaks
  - Plant engineering and plumber routinely monitors for evidence of new or recurring water leaks
  - Brine consumption
  - Visual inspection of brine tanks
  - Monitoring use of wipes with Patients who tend to flush things down the toilets
  - Monitoring pipes and toilet function regularly to watch for potential breaks
  - Scheduled inspections of mechanical spaces after regular hours
  - Floodplain assessments
  - Monitoring snow levels on the roof
  - Monthly testing of cooling towers during operation
  - Monthly legionella testing of water systems by vendor
  - Weekly dipslide bacterial testing of water systems
  - Daily chemical testing of water systems
  - Monitor and read water meters every 3 hours and capture irregularities
- Medical Gas Source/Delivery
  - Yearly inspection of all medical gas outlets (including leaks) of oxygen, air and vacuum by external partner
  - Monitoring of alarm panels and upgrades
  - Daily and weekly checks in place
  - Oxygen system monitored throughout hospital at various control valves
  - Daily readings are taken at the supply tanks
- Fire Suppression
  - Fire pump system monitored for pressure
  - Annual inspections of the fire panel
  - Quarterly inspections of the suppression system
  - Annual inspection/certification of sprinkler systems
  - Monthly fire drills
  - Yearly fire alarm testing
  - Monthly fire extinguisher inspections
  - Code red response
  - Weekly fire pump testing
- Power Supply
  - Generators exercised/tested weekly
- Aging Infrastructure
  - Monitor roof condition
  - Regular roof walks to keep drains clear and functioning and damage free
- Elevator Systems
  - Monthly maintenance inspections
  - TSSA does regular inspections and licenses renewed on an annual basis
- Negative Air Flow Rooms
  - Daily checks of negative air flow rooms completed by engineering resources