

Project Title: Fire Alarm and Control System Installation

Dam and Reservoir Project: Lower Granite

Estimated Total Cost: \$1-3 Million

Estimated Schedule for Completion of the Project: Phase 1a: FY2019

Phase 1: FY2020-2021

Phase 2: FY2022-2024

Expected Physical Completion: FY2024

Project Background

Fire protection, including fire alarm systems, is a critical component of the Walla Walla District (NWW) Safety Program with the goal to ensure that facility staff, contractors, and visitors are safe; the facility is protected; and the capability to generate power is not disrupted by fire. Accordingly, NWW staff commissioned a contractor, CH2MHILL, to conduct a Life Safety Assessment (LSA) and a Fire Hazard Analysis (FHA) for its six hydroelectric powerhouses at Dworshak, Lower Granite, Little Goose, Lower Monumental, Ice Harbor, and McNary dam and reservoir projects. In the resulting LSA/FHA Report, life safety and fire code concerns were identified at all six hydroelectric powerhouses. The report included recommendations to correct the concerns found and estimated costs. NWW staff then prepared a report that validated the CH2MHILL findings; confirmed and evaluated the recommendations; provided a prioritized list of recommendations based on risk and feasibility; and reviewed the CH2MHILL initial cost estimate.

According to the results in the LSA/FHA Report and the NWW Validation report, the Fire Alarm and Control Systems at all six hydroelectric powerhouses were ranked as the highest need in NWW and are therefore scheduled to be designed at the same time to gain efficiencies and promote consistency throughout NWW.

NWW Priority	LOWER GRANITE
1	FIRE ALARM AND CONTROL SYSTEM (FAS)
2	EGRESS AND EMERGENCY LIGHTING
3	MODIFICATION OF EXIT STAIRS
4	ILLUMINATED EXIT SIGNS
5	PENETRATIONS OF RATED WALLS (AND FLOORS)
6	COMPARTMENTALIZATION
7	CONTROL ROOM PRESSURIZATION MODIFICATIONS
8	SMOKE CONTROL LIFE SAFETY ANALYSIS

Project Justification

Lower Granite dam and reservoir project does not currently have a fire alarm system. Providing a fire alarm, mass notification, and control system throughout the powerhouse is ranked as the highest priority (#1) action by the NWW Validation Team. The minimum established criteria for existing Department of Defense facilities is defined in Unified Facility Guide (UFG) 3-600-01, Fire Protection Engineering for Facilities, paragraph 1-3.1 which states that existing facilities must meet National Fire Protection Association (NFPA) 101, Life Safety Code, for existing occupancies. This code was the basis that CH2MHILL used for occupancy classification and the majority of fire protection requirements it identified in its report, in addition to other NFPA codes. This system is required by the Life Safety Code (2012 NFPA 101-40.3.4), as it affects the life safety of all occupants. The life safety of the occupants depends upon how quickly egress can be executed, and this in turn is dependent upon timely fire warning to all occupants. Additionally, the ability to contact offsite emergency services in a timely manner would reduce the response time of emergency responders, potentially saving lives and reducing damage to the facility.

A number of other priority actions identified in the LSA/FHA Report are directly related to the Fire Alarm and Control System Installation, including egress and emergency lighting, modification of exit stairs, compartmentalization (the ability to isolate fires, which gives occupants more evacuation time), control room pressurization modifications, and smoke control life safety analysis. For this reason, these actions will be further developed to a conceptual level during Phase 1a to ensure compatibility with the Fire Alarm and Control System design.

Strategic Context

The System Asset Plan relies greatly on the Strategic Asset Management Plan (SAMP), which identifies a forecast for the optimal level of funding and optimal equipment replacement dates associated with minimizing the lifecycle cost of each asset. These results are intended to be directional and provide the general timing for equipment replacement used to formulate the System Asset Plan.

In this case, the Fire Alarm and Control System was not in the equipment inventory prior to the formulation of the SAMP so was not modeled and prioritized with other equipment. The asset will be inventoried and will be included in future prioritization runs. The budget associated with this project, however, was included in the SAMP.

The current recommendation for the Fire Alarm and Control System aligns with the timing in the 2018 System Asset Plan. The prioritization process for the System Asset Plan incorporates the benefits and costs of all projects using a consistently applied value framework and optimizes project timing to maximize system value.

Objective(s)

The primary objective of this project is to provide an up-to-date fire alarm, mass notification, and fire control system throughout the Lower Granite powerhouse. The project includes all materials and labor necessary to place the equipment into service.

Summary

A fire alarm and control system is required by NFPA Life Safety Code 101, and satisfies the NWW validation team's primary objective of occupant life safety.

Proposed Alternatives

Due to the preliminary nature of this effort, the Corps will develop at least two alternatives that will meet the objective for this project: installation of an up-to-date fire alarm and mass notification system using common speakers and visible signals and a control system throughout the Lower Granite Powerhouse. The Corps will consider the following attributes during this development process:

- Manual initiation (pull stations) at exits and at 200 foot intervals
- Smoke detection system in selected areas (including main powerhouse floor, main electrical equipment areas, powerhouse control room, etc.)
- Compliance with UFC 3-600-01 and mass notification UFC 4-021-01
- Main Controller for fire alarm reporting or mass notification message initiations or receipt at the power house control room
- Digital Alarm Communicator Transmitter (DACT) for communication to offsite location, such as a central station
- Automatic detection on powerhouse floor for initiation of smoke and heat venting
- Automatic initiation of pressurization system for stairs
- Hold-open devices on doors as required
- Elevator recall
- Supervisory control of existing fire suppression systems
- Audible and visible signals with annunciation in the main control room or other constantly attended location
- Override control of the HVAC system fans and dampers where possible and required during a fire event

Status Quo – Do Nothing

Summary: This alternative would leave Lower Granite without a Fire Alarm and Control System.

Alternative 1 – Provide a Fire Alarm and Control System (To be developed during Phase 1a)

This alternative will install an up-to-date fire alarm and mass notification system throughout the Lower Granite Powerhouse using common speakers, visible signals, and a control system. The development of this alternative is anticipated to include consideration of the above listed attributes.

Alternative 2 -- Provide a Fire Alarm and Control System (To be developed during Phase 1a)

This alternative will also install an up-to-date fire alarm and mass notification system throughout the Lower Granite Powerhouse using common speakers, visible signals, and a control system. The development of this alternative is also anticipated to include consideration of the above listed attributes.

Process

Phase 1a: 2019 activities involve Lower Granite and NWW personnel including operations, engineering and project management offices, as well as Bonneville Power Administration's (BPA) Generating Assets personnel.

- Develop initial project schedule and budgetary cost estimates for design and construction of the alternatives.
- Concept level design.
- Achieve efficiencies by combining Phase 1a efforts with the other five dam and reservoir projects.

Phase 1: 2020-2021 activities involve Lower Granite and NWW personnel including operations, engineering and project management offices, as well as BPA's Generating Assets personnel.

- Prepare Plans & Specification for 60% & 90% Design Reviews.
- Prepare contract documents to Biddability, Constructability, Operability, Environmental, Sustainability (BCOES) level.
- Revise/Update total project cost estimate.
- Advertise contract and pre-award acquisition activities.
- Achieve efficiencies by combining Phase 1 efforts with the other five dam and reservoir projects.

Phase 2: 2022-2024 activities involve Lower Granite and NWW personnel including operations, engineering and project management offices, as well as BPA's Generating Assets personnel and contracted personnel and equipment for construction.

- Award and execute the contract.
- Administer contract, submittal reviews, and development of as-built drawings.
- Closeout contract and subagreement.
- Achieve efficiencies by combining Phase 2 contracting efforts with the other five dam and reservoir projects.

Performance Metrics

New Fire Alarm and Control System placed in service within scope, schedule, and budget. Installation of this system will improve personnel safety and lower the risk of equipment and facility damage.