

From Lessons-Learned to Action Items -Case Study of Major Dam Intake Structure Rehabilitation with a 100' Deep Cofferdam

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This paper presentation will be a case study of the process by which a major prototype trash rack guide rail rehabilitation project at Conowingo Dam was improved upon and successfully repeated with significant safety improvements and cost reductions through the development and implementation of a robust lessons learned matrix. In 2012, Crofton was awarded a contract for engineering, fabrication, and installation of a 100' tall asymmetrical C-shaped cofferdam and the design and installation of a modular stainless-steel rail system for the replacement of the existing aging trash rack guide rail system. This included a requirement that the new trash rack guide system be capable of withstanding the unwatering head pressure associated with placing head gates in the trash rack slots to dewater the head gate slots for future rehabilitation. The 2012 project scope of work included the design, delivery, and installation of the cofferdam system and the design and installation of the new modular rail system in one trash rack guide slot of the four slots located in Unit 9 of the Conowingo powerhouse intake structure. This project would serve as a prototype for the use of the cofferdam system and the rehabilitation approach for the guide slot. The 100' deep cofferdam was designed with numerous features that created a safe space for workers to conduct rehabilitation in a dry workspace. The modular rail design addressed demolition, anchoring, alignment, and grouting. Notes were meticulously recorded during the project to make future efforts safer and reduce overall production times in the hopes of eventually completing an entire unit of four guide slots within a single outage. These notes were organized into a lesson's learned matrix spreadsheet which was circulated to all the major contributors to the project. Throughout the span of time between prototype project completion in 2012 and resumption of rehabilitation in 2017 meetings were conducted to refine the approach and the owners invested heavily to ensure a 2017 project that was safer and more streamlined. In 2017, two out of four guide rails, or one half of a unit, was rehabilitated within a single outage on a budget of \$10.5 million. In 2018 a full unit of four guides was rehabilitated on a budget of \$9.1 million. Finally, in 2019, four guides were completed on a budget of \$8.7 million and our budget for 2020 for a full unit of four guides is \$8.0 million.