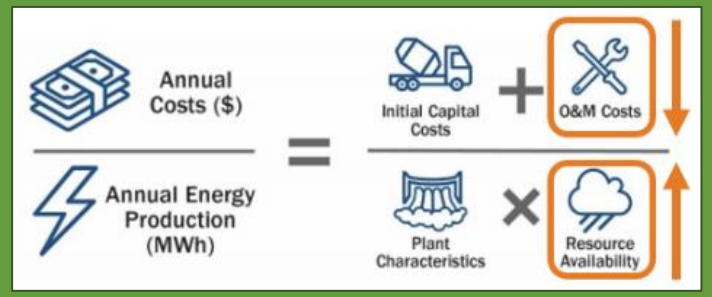
CRUST

(Ceramic Rust Universal Sealant Technology)

Objective

Develop a low-cost and easy-to-apply CBPC (Chemically Bonded Phosphate Ceramic) coating to drastically reduce corrosion of steel hydropower structures and thus decrease the levelized cost of energy.



Problem Impact

- Annual corrosion-related costs total about $17 billion USD for the electric power industry.[1]
- Corrosion has two negative impacts on the hydropower levelized cost of energy: it increases O&M costs while lowering resource availability.

[1]*NACE International Corrosion Costs and Preventive Strategies in the United States, 2001*

Approach

1) Assess CBPC coating usage in other industries (land-based heavy infrastructure).

2) Create candidate CBPC formulations and spray application method in-house.

3) Test and compare with commercially available coatings and provide a recommendation for a pilot program to WPTO.

Technology

- Several different CBPC coating formulations are currently used in non-hydropower land-based applications.
- CBPCs chemically bond to the substrate and form an iron phosphate layer with a ceramic outer coating, with a cure time of approximately 20 minutes, minimizing downtime.
- This coating provides protection with a ceramic shell that resists corrosion, fire, water, abrasion, chemicals, and temperatures as high as 205 degrees Celsius.