

## Design Considerations on Cathodic Protection for X65 Steel Tank Containing Fresh Water

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**Abstract :** The present study focused on critical and detailed approach for using aluminum electrode as impressed current anode for cathodic protection of X65 steel tank containing fresh water. The impressed current design calculation showed 0.6 A of current demand and voltage of 0.33 V required to adequately protect the X65 steel tank with internal surface area of 421 m<sup>2</sup>. We used here one transformer rectifier with current and voltage output of 25 A and 25 V, respectively. The data showed that the potentials ranged from -0.474 to -0.509 V (vs. Cu/CuSO<sub>4</sub>), prior to the application of cathodic protection. When the potential was measured 1 h after the application of cathodic protection, the potential values showed considerable shift within protection range (-0.950 V vs. Cu/CuSO<sub>4</sub>). The results confirmed that aluminum anode can be used in freshwater applications with high efficiency (current capacity) and low consumption rate.

**Keywords :** cathodic protection, aluminum, steel, fresh water

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