AMPCO Interrogatory #95

Interrogatory

Reference: Ex D2 T2 S10 P41

In 2012, the Full Definition BCS included another alternative to construct a "drum warehouse" inside the protected area. This alternative would have used drums to store 1700 m3 of DRP heavy water, and still required construction of a smaller D2O facility to meet operational improvement needs and for TRF life extension. This alternative was rejected because it would have had an unacceptable impact on the DRP critical path. This time and associated cost would have added to the critical path of each unit's refurbishment outage with an estimated total generation revenue loss of $480M.

a) How many drums are required to store 1700 m3 of DRP heavy water?

b) Please provide the calculation of the estimated total generation revenue loss of $480M and provide all assumptions.

Response

a) Approximately 7200 drums would be required to store 1700 m3 of DRP heavy water.

b) Please see the below step-by-step calculation of the estimated total generation revenue loss of $480M:

- Total volume of the PHT and moderator systems of one unit is 845 Mgs (or 761m^3 of D2O)
- Total drum storage required for one unit undergoing refurbishment is 3,966 drums (845,000/213)

- Assumption 1: Operations can fill 45 drums in one 12 hour shift. Therefore, the number of drums filled in one day is 90
- Number of days to drain 845 Mgs of D2O is 44 (or 1.44 months)

- Assumption 2: Number of drums transferred back to the unit in one 12 hr. shift is 25. Therefore, number of drums transferred in one day is 50
- Number of days to refill the PHT and Moderator systems is 79.3 (or 2.6 months)

- Total duration to drain and refill PHT and moderator system during unit refurbishment under the “drum warehouse” alternative to the D2O Storage Project is 79.3 + 44 = 123.4 days (or approximately 4 months)
- Actual refurbishment schedule allowance to drain and refill the PHT and moderator systems using the D2O Storage Project Tanks is 22 (or 0.7 months)
- Net impact on refurbishment critical path is 123.4 – 22 = 101.4 days (or 3.3 months) of delay/unit

- 2012 average nuclear generation revenue = $56/MWhr
- Unit electrical output is 878MW per day running at 100% power
- Daily revenue generated by Darlington unit is 878 x 24 x 56 = $1.18M/day

- Total unit generation loss to OPG using drums to drain/refill one refurbishment Unit is 101.4 days x $1.18M/day = $119.6M in lost revenue

- Total lost in generation revenue during four unit DRP is 4 x $119.6M = $478.6M