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COMPLETE WASTE MANAGEMENT DURING A POWER UPRATE OUTAGE

Lee Hammel
Progress Energy/Carolina Power & Light/Brunswick Nuclear Generating Station
Highway 87 North, Southport, NC 28461

Scott Dempsey
MHF Logistical Solutions
800 Cranberry Woods Drive, Suite 450, Cranberry Twp., PA 16066

ABSTRACT

This paper identifies the advantages of utilizing one vendor to complete the bulk packaging of radioactively contaminated large components and normal Dry Active Waste (DAW) and to provide private rail transportation to direct disposal. This paper will also show the methodologies utilized to achieve a safe, reliable, and cost effective solution while working during critical path evolutions routinely recognized in today's deregulated Utility market.

INTRODUCTION

Progress Energy's Brunswick Nuclear Station began the first of four Power UpRate Outages in March of 2002. Each Power UpRate Outage involves the removal and replacement of specific large components and support equipment with a combined end result of increased electrical generation output.

Progress Energy developed a Request for Quote (RFQ) involving the receipt, characterization, profiling, packaging, shipping documentation preparation, transportation, and final disposition of the large components and associated material and distributed the request to various waste processors, disposal facilities, and transportation vendors. The intent of the RFQ was to identify one vendor capable of providing a sole source contract to Progress Energy for each of the four years. The RFQ process identified the most cost effective, safe, and timely disposition of the material was contracting with a vendor to complete all onsite activities identified above and transport the material for direct burial at a licensed disposal facility. The disposal of the components and material was contracted from Progress Energy directly to the licensed disposal facility.

Components and Material

The initial outage was conducted on Unit 1 and involved the replacement of the High Pressure Turbine, seven complete High Pressure Turbine Diaphragms, two Reactor Feed Pump Turbines, six complete Reactor Feed Pump Turbine Diaphragms, two Feedwater Heaters, and Miscellaneous Materials & Dry Active Waste generated during the outage. Each of the components were removed during different phases of the project and from various locations within the Power Block. Most importantly, the large components were removed during the critical path time frame during the beginning of the outage.

Packaging

The vendor provided packages with blocking and bracing preinstalled to receive the components directly from the power block. The High Pressure Turbine Rotor, Feedwater Heat Exchangers, and Feed Pump Turbine Diaphragms were packaged into Private Gondola Railcars. The vendor eliminated void space by placing and securing additional waste material within the gondola. The Gondolas were fabricated to ensure "Strong Tight Package" requirements were met. The vendor also supplied intermodals to package the High Pressure Turbine Diaphragms and sea vans to package miscellaneous heavy metals and DAW. 96 cubic foot, soft sided, Lift Liners as well as an intermodal compactor were utilized to increase the package density of DAW and light gauge metals prior to shipment.

Outage

The initial outage schedule identified a fourteen-day critical path window to remove and package the components and additional material. However due to pre-staged packages with preinstalled blocking and bracing the turnover of the material was reduced to seven days.

Shipping & Disposal Documentation

The vendor completed all submittals required to obtain a "Waste Profile" from the disposal facility and the large components and miscellaneous materials were characterized and manifested based on a per package basis.

Advantages

Brunswick recognized four areas of advantages as a result of their RFQ efforts: Overall Support, ALARA, Safety, and Cost Effectiveness.

Overall Support

Brunswick Nuclear Station recognized the advantages of working with one vendor who coordinated all material loading efforts with the applicable Brunswick Component Project Manager, provided private rail transportation of all material during one rail shipment, and completed all shipping documentation for final review and approval. Brunswick also recognized the timely disposition when directly disposing the material at a licensed burial facility.

ALARA

The vendor demonstrated an As Low As Reasonably Achievable (ALARA) benefit to the Power UpRate project as well. As radioactive material was physically handled less, worker exposure was decreased. Because the vendor was able to maximize the amount of material in each package, workers spent less time handling, surveying, and inspecting packages as the amount of

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the packages decrease. The exposure at off site processing facilities was also eliminated due to the direct disposal of the material. The vendor recorded no exposure levels during the outage.

Safety

Zero reportable accidents were recognized during the loading and shipping evolutions of the outage. This result was attributed to the fact that the vendor is experienced in handling large components and packaging them into rail conveyances.

Cost Effectiveness

The vendor reduced the total amount of packages required to ship the material to the disposal facility by maximizing their private high capacity rail equipment. The vendor eliminated the additional cost of onsite labor needed to size reduce and package the components, the multiple over the road truck shipments, and special over the road permitting requirements.

Conclusion

Upon completion of the outage, Brunswick Nuclear Station, through their onsite vendor, shipped three gondola railcars and three articulating bulk commodity cars, with nine sealands and five intermodals, to a licensed disposal facility for direct burial. The total, gross volume was 21,800 cubic feet, the total gross weight of the material was 765,000 pounds.

This Project allowed Brunswick the opportunity to recognize not only significant cost savings but also a safe, efficient, and streamlined process.