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Case No. 504: Urea SCR System Installed on a 6555 HP Wärtsilä 16V32 Diesel Engine Used for Prime Power

Teck Cominco Alaska, Inc. had a need to control NOx emissions from their new Wärtsilä diesel engine at Red Dog Mine to meet Alaska DEC permitted NOx limits. The engine is operated more than 6,000 hours per year to provide prime power for the site.

NOx Limit 18.2 lbs/hr.....Achieved 4.85 to 14.09 lbs/hr (70% to 100% load)
NOx conversion.....Achieved 87.6% to 93.4%
NH₃ Slip Limit 30 ppmv.....Achieved < 2 ppmv
(All limit requirements were exceeded)

Background

Teck Cominco Alaska Inc. (TCAK) operates the Red Dog Mine facility, located 90 miles north of Kotzebue, Alaska. Prime power for this mining campus, including living quarters is provided by six existing and one new Wärtsilä 16V32 diesel engines. To meet the Alaska DEC air permit NOx limits for the new engine (MG-17), TCAK contacted AMEC E&C Services Ltd., of Vancouver, BC, who in turn contacted Johnson Matthey for an SCR system.

This challenging installation, due to its location, was handled by Amec E&C Services with commissioning by Johnson Matthey. After initial start up, it was observed that ash build up on the catalyst was reducing NOx conversion performance. This was remedied by use of a lower ash non-marine lube oil and a more open catalyst cell structure. After these changes, the SCR system has operated over 8,000 hours to date with no problems.

Summary

- **Product:** Urea SCR system
- **Application:** 6555 Hp Wärtsilä 16V32 diesel engine
- **Customer:** Teck Cominco Alaska, Inc.
- **Location:** Kotzebue, AK
- **Installed By:** Red Dog Mine
- **Date Installed:** November 2003
- **Operation:** Prime power, 6,000+ hours/year
- **Pollutants:** NOx
- **Comments:** Johnson Matthey was chosen to supply this urea SCR system because of their excellent reputation and human and financial resources.

Installation of the power house



Power house enroute to the site



Johnson Matthey SCR housing

