Overview
Slag carry over from ladle to tundish has a serious effect on casting operations, with negative impact on yield, quality and safety. Nupro Corporation has applied expertise in metallurgy, vibration analysis and software design to the development of the SlagTracker, a reliable, real time Slag/Vortex Detection System customized to meet your specific plant needs.

Example Benefits
• reduced yield loss (steel left in ladle) over 60%
• heats on sequence increased by 20%
• improved steel cleanliness, sliver defects down by 50%
• improved tundish refractory life, up to 40%
• reduced nozzle clogging, improved productivity
• minimal maintenance costs, no caster downtime required
• prevention of slag-induced breakouts
• typical payback less than one year

Nupro Slag Detector
The Nupro SlagTracker System is internationally accepted technology and has demonstrated its ability to recognize the initial incidence of slag entrainment in the steel stream as it exits from the ladle. This information enables the operator to minimize the incidence of slag entrainment while at the same time maximizing steel yield. SlagTracker is being used by numerous steel casters worldwide.

Nupro Corporation is the assignee of United States patents which describe the monitoring of vibration and process variables for the detection of slag and other disturbances occurring during the casting of steel. The Nupro SlagTracker is the commercial application of the subject patents.

Tundish Vision
A SlagTracker system includes a camera that detects near-IR wavelength light and is focused on the tundish pour box. The image analysis produces a redundant alarm that may be relied upon in the event that the vibration alert is disabled. This image is also useful to the operator to monitor flux cover and other conditions within the pour box area. The image is recorded along with other caster information to provide a comprehensive record of the final stage of ladle teeming on each heat. Records are automatically archived on the SlagTracker computer.

Grade Specific Sensitivity
Depending upon the product mix at your plant, the slag detection system can be programmed with separate grade family sensitivities, such as low, medium, and high. These grade sensitivities facilitate the optimum ladle shut-off time in each case. For example, high sensitivity allows very little slag carryover but may leave some steel in the ladle; whereas, low sensitivity allows more slag carryover and less residual steel in the ladle.

Shroud Alignment
When a new ladle is brought into position above the caster, the SlagTracker shroud alignment feature visually shows the operator when the shroud is properly aligned.

Proper shroud alignment helps to minimize air aspiration and helps to attain the ‘as-designed’ steel circulation in the pour box both of which are important for steel cleanliness and castability.
Custom HMI Designed to Your Needs

Nupro can design appropriate HMI screens for any project scope. Typical operator interface locations are the ladle deck, main CPU location, and the main control pulpit (optional). A standard operator interface software screen can be ordered or a custom screen can be provided to address specific project scope.

Ethernet network to function. The Nupro SlagTracker has been designed for reliable slag detection even in the case of limited data availability.

Rapid Commissioning

Extensive installation experience allows for rapid onsite commissioning. Depending upon the unique project requirements, commissioning can occur in 2 weeks after system hardware installation.

Customer Service

Nupro works with the you to ensure that the SlagTracker meets the requirements of your specific operation. Your satisfaction is our number one priority.

Worldwide Service

Nupro Corporation is based in the United States and has agents or representatives or VAR’s in Europe, Asia, Australia, North and South America. Nupro agents are trained in system operation and should they need it, have direct access to Nupro engineers. Nupro uses Virtual Private Network (VPN) technology to provide remote system support to our agents as required. Contact Nupro for the appropriate representative in your area.

Self Diagnostics

The Nupro SlagTracker has internal verification of system operation. In the rare case that a sensor fails, a warning light appears on the software HMI display. The sensor can then be replaced. Nupro can supply spares when the system is purchased and provide additional spares as required.

Nupro can provide a completely redundant system that can be used if the main system requires maintenance. The redundant system can be purchased as required or specified as part of the original system. Also, heartbeat signals are sent both to and from the PLC to maintain data continuity.

Plant Data Flexibility

The Nupro SlagTracker system uses the latest OPC server software over Ethernet to interface to the caster PLC. Most networked PLC’s are supported.

In some cases, the steel plant cannot provide the numerous process signals that are useful to ladle slag detection systems. The Nupro slag detection system does not require a plant.