

ATI Systems Provides a TETRA Radio Based Public Address System for HMEL's Refinery Project in India

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ATI Systems provided a state-of-the-art wireless public address system for the state-of-the-art refinery, Guru Gobind Singh Refinery (GGSR). GGSR is owned by Hindustan Mittal Energy Limited (HMEL) a joint venture between Hindustan Petroleum Corporation Limited (HPCL) and Mittal Energy Investments Pte Ltd, Singapore, a Lakshmi N Mittal Group Company. The refinery is located in the village of Phulokheri, Bhatinda, Punjab, India and has an annual capacity of nine million tons or 180,000 barrels per day. The construction of the refinery started in 2008 and the public address system was delivered in February 2012, just before the refinery was commissioned in March 2012.

The independent wireless public address system covers both indoor and outdoor areas in the refinery complex. It connects to the fire alarm and telephone systems and it interfaces to the wireless TETRA trunked system. The system includes visual strobe alerts, audio tone alerts plus pre-recorded messages and live public address. The system has two control stations, each of which monitors and controls the whole system. Outdoor notification is provided by 38 High Powered Outdoor Speaker Stations, each with 1600 watts of audio power. Indoor notification is handled by 57 Indoor Speaker Units which control over 900 four-watt speakers distributed throughout the buildings in the refinery complex. The system also includes [Remote Terminal Units \(RTUs\)](#) that control visual warnings and connections to other alert and communication systems in the refinery. These include: 10 Strobe RTUs powering 60 strobes, a fire alarm interface RTU, a radio transfer RTU and one telephone interface unit.

Communication between the control stations and remote units of the wireless public address system is accomplished with digital radios using the Terrestrial Trunked Radio (TETRA) system. TETRA is the European Telecommunications Standards Institute (ETSI) standard, specifically designed for use by government agencies, emergency services, for public safety networks, transport services and the military. The refinery complex uses TETRA communication and required its use in the public address system. Its IP-based highly-resilient architecture is implemented at the refinery as a fully redundant system which offers high flexibility and scalability as well as a secure environment for routine daily communication requirements.

Abed Yassine, ATI Systems Vice President of Operations, was in charge of modifying ATI Systems equipment to work with the refinery's communications requirements. "This system was different from most because of the digital radios, using the TETRA platform. We usually use

radios in analog mode and it was a challenge to use digital communications, especially sending data from one-to-many points.” Abed’s engineering team was able to modify ATI’s equipment to work with the TETRA specifications due to ATI’s modular, standards-based and flexible system design. “Now we can use these for other projects as well.”



ATI Systems’ HPSS16 siren installed at the HMEL GGSR refinery

Security and redundancy were designed into the wireless public address system at every level. For system control, there are two [ATI Control Stations](#) located in different buildings. The two control stations are functionally identical so that if there is a problem at either one of them the other can take over and control the entire wireless public address system. Each can communicate with all of the remote units of the system, as well as each other, to conduct polling, silent tests, alarm tone activations, pre-recorded messages, and live voice broadcasts. The status of the wireless plant communication system is continuously monitored and includes: backup battery and AC power status, cabinet intrusion, speaker status, radio communications as well as success or failure of the latest activation or test. Each control station includes an [ATI Communication Control Unit](#), a computer running ATI’s MassAlert® software and a noise-cancelling microphone for live public address announcements.

ATI’s proprietary [MassAlert®](#) software provides a user friendly interface which is simple, intuitive and easy to use even in the most stressful emergency situations. It includes both menu driven functions and a Graphical User Interface (GUI) based on refinery specific customized maps with icons to show the location and status of the individual components of the outdoor and indoor warning system. System activation can be easily controlled from the

MassAlert® software. Activations can consist of tones and pre-recorded messages, or live audio messages delivered through the noise cancelling microphone. During and after an activation, the software receives and displays the success or failure code from each remote unit being activated.

The wireless public address system at HMEI was customized to allow activation of the entire system all at once, or a selective activation of only specific areas of the refinery complex. ATI's MassAlert® software was configured so that refinery officials can broadcast messages to certain pre-defined zones within the refinery or individual buildings as required by the situation at hand. In addition, the system was designed to allow activation from the master fire alarm control panel. The public address system interfaces with HMEI's telephone and radio systems such that alert messages are broadcast to the hand-held and base-station TETRA radios, and to the refinery's EPABX telephones. Using multiple message pathways like this improves the reach of the PA and alert messages throughout the refinery personnel.



Technician working on a HPSS16 at the refinery

The outdoor alert notification is transmitted through 38 [High Powered Outdoor Speaker Stations \(HPSS16\)](#) with 1600 watts of power each. The HPSS16 sirens are placed strategically throughout the refinery complex for proper acoustic coverage. They provide tone alerts as well as intelligible voice notification for pre-recorded messages and live public address. The units are positioned and oriented to minimize echoes, while providing the capability to

simultaneously hear announcements and messages from a variety of different directions with minimal sound delay.

In order to alert personnel within the buildings at the refinery, indoor notification is provided by 911 four-watt speakers located in buildings throughout the refinery. The speakers are controlled and powered by 57 [Indoor Speaker Units \(ISUs\)](#). The ISU provides up to 400 watts of continuous audio output power for reliable alert tone notification, voice instructions and public address, and is monitored and controlled through the ATI Central Control Station. Additional notification in the control and classified areas is provided by 60 strobe lights, powered and controlled by 10 Strobe RTUs. Visual alerting via strobe can be very useful as in areas where the ambient noise level is very high.

About ATI Systems

Founded in 1981, ATI Systems (Acoustic Technology, Inc.) designs, manufactures, and installs dependable emergency warning and notification systems. ATI's advanced technology is currently protecting military bases, industrial facilities, campuses, and communities worldwide, with an innovative and flexible wireless system that reliably provides audible and visual warning messages. The systems utilize a compact hardware design, user-friendly software, and the latest advances in communication methods, including radio frequency, IP Ethernet, and satellite technology. Through product design enhanced by years of experience in acoustic modeling, ATI Systems' products provide exceptional sound coverage and voice intelligibility in both outdoor and indoor settings. Their systems can be found throughout North America, Europe, the Middle East, and Asia. To learn more about ATI Systems, visit <http://atisystem.com>.