Workers in oil and gas fields know what it's like to work in a dirty, loud environment. Drilling rigs, pumps, generators, fluid movement, and heavy equipment create a lot of noise, dust and mud. Workers need hearing protection that can withstand these elements and allow them to communicate with co-workers and monitor their area for sounds that could alert them to danger.

Improving hearing conservation within the oil and gas industry requires accurate detection of noise hazards, proper selection of hearing protection solutions and comprehensive hearing conservation programs designed for the rigors of real-world conditions.

The Extreme Environmental Conditions:

Oil and gas workers in various operations encounter a wide range of climates and working conditions. It can be extremely hot or very cold, depending on the location and time of year. Hands and gloves are seldom clean, and workers' hearing protection must be designed to handle the challenges of these environments.

The Need for Noise Detection:

Detecting job site noise levels is the first step in determining the appropriate level of hearing protection. Operators need the ability to accurately measure each employee's noise dose to understand the level of protection required for workers.

The Importance of Listening:

While most workers need hearing protection, they may also need to listen for warning sounds like approaching vehicles and equipment problems. Hearing protectors must have the correct attenuation for the environment to avoid overprotection.

The Value of Communication:

Many workers and maintenance teams need to clearly communicate with co-workers and supervisors throughout the operation. In these situations, communication devices can be key to both safety and productivity.

The Human Factor:

Each individual is physically unique, so there is no one-size-fits-all solution – workers in the same environments may need different protection solutions. The key to achieving success is offering enough different solutions to fit each person comfortably.

Fit Test Validation:

Integrating hearing protector fit testing into your hearing conservation program using the 3M™ E-A-R™ Fit Test Validation System makes it easy to fit, train and motivate workers, and to assess and manage the long-term performance of your hearing conservation program.

Prolonged or repeated exposure to loud sounds may cause hearing loss and tinnitus (“ringing” in your ears), and may contribute to sleep disturbance, hypertension, anxiety, and stress. Retaining and protecting your workforce is essential to the success of your operation, making it more important than ever to implement comprehensive hearing conservation solutions.

**ORA TAC radio connector assemblies are sold separately. Please contact 3M Peltor Customer Service for a list of available radio connector assemblies.**

**Hearing Protection Product:**

These hearing protectors help reduce exposure to hazardous noise and other loud sounds. Because of failure to wear hearing protectors at all times that you are exposed to noise may result in hearing loss or injury. For proper use, see supervisor, User Instructions, or call 3M PS™ Technical Service in the USA at 800-243-4630. If there is any drainage from your ear or you have an ear infection, consult your physician before wearing earplugs. Failure to do so may result in hearing loss or injury. For proper use, see supervisor, User Instructions, or call 3M PS™ Technical Service in the USA at 800-243-4630.
Key Sources of Sound in Oil & Gas Operations

3M recommends* that companies provide a comprehensive hearing conservation program for all employees exposed to 8-hour Time-Weighted Average (TWA) sound levels at or above 85 decibels on the A-weighting scale (dBA), including:

- **Noise Exposure Monitoring:** Measure noise levels and monitor employee TWA exposures to identify which employees to include in the hearing conservation program and to help select appropriate hearing protection devices.
- **Engineering and Administrative Noise Controls:** Reduce employee noise exposures by controlling noise at the source, enclosing and/or isolating noisy equipment, limiting time spent in high noise areas and moving employees away from noise sources when feasible.
- **Hearing Protection:** Provide a variety of hearing protection devices, including at least one type of earmuff and several types or sizes of earplugs. Hearing protectors must be capable of reducing the TWA noise exposure of the wearer to 80 dBA or, preferably, to 85 dBA or below. Individual fit testing of employees is the preferred method to validate the fit of hearing protectors.
- **Audiometric Testing:** Provide a baseline hearing test for each employee in the hearing conservation program as soon as possible after the noise exposure begins and provide annual hearing tests as long as the employee is in the program to detect any work-related changes in hearing over time.
- **Employee Training and Motivation:** Train all employees who are enrolled in the hearing conservation program annually. Training should include information about how noise damages hearing, the importance of hearing testing, proper fitting and use of hearing protection devices, and the value of hearing well.

### Exploration & Production

Many of the processes involved with oil and gas exploration and production produce noise hazards, from heavy equipment and generators, to drill rigs and blasting. Exploration workers face a wide range of hearing protection challenges in both on-shore and off-shore explorations.

**Key Upstream Challenges**

- **Noise Measurement:** Exploration workers can be exposed to a wide range of potential noise hazards. Understanding the noise exposure will allow you to more effectively manage your hearing conservation program.
- **3M™ The Edge S Personal Noise Dosimeter is a lightweight, easy-to-use, intrinsically safe solution for monitoring personal noise exposure.**
- **Oily and Dirty Hands:** Hands and gloves are seldom clean, and are usually covered with ever-present oil and dirt. 3M™ Push-Ins™ Earplugs are a perfect choice because there is no roll down required for a clean and comfortable fit.
- **Communication:** Clear communication between co-workers is essential to both productivity and safety. 3M™ Peltor™ Lite-Com Pro II UHF Intrinsically Safe Two-Way Radio Headset enables clear communication.

### Transportation & Storage

Compressors, pumping stations, vehicle noise, and fluid movement all produce noise during the transportation and storage process. Workers installing pipelines and rehabilitating critical infrastructure encounter challenges to their safety and productivity.

**Key Midstream Challenges**

- **Noise Measurement:** Workers who operate and work around these operations face a wide range of noise hazards. Measure variable noise levels with the 3M™ Intrinsically Safe Sound Examiner SE-400 IS Series Sound Level Meter.
- **Personal Protection Equipment (PPE) Integration:** Workers at hydraulic fracturing operations need hearing protection solutions that do not interfere with respirators and hard hats. 3M offers a variety of in-ear hearing protection solutions that are compatible with respirator facepieces, including 3M™ Push-to-Fit and Reusable Earplugs and the 3M™ Peltor™ ORA TAC In-Ear Tactical Communications Headset.
- **Dirty Hands:** Hands and gloves are seldom clean, and temperature extremes often dictate the type of protection equipment that workers prefer. Providing workers with both earmuffs and a variety of earplugs allows workers to select the right protection for variable conditions.

### Refining & Processing

Oil and gas refineries are highly automated complexes with high levels of noise throughout the facility. Compressors, pumps and high volumes of fluids running throughout the facility create a significant amount of noise.

**Key Downstream Challenges**

- **Noise Measurement:** Maintenance teams at refineries can encounter a wide range of noise exposure levels as they work. 3M™ NoisePro™ Personal Noise Dosimeter can help measure exposure levels without interfering with maintenance and repair work.
- **Noise Level:** Workers can encounter very high noise exposures from pumps and moving fluid. 3M™ Peltor™ Earmuff X5 is the first 3M earmuff on the market to offer a Noise Reduction Rating (NRR) of 31 decibels.
- **Communication:** Workers in these large complexes need the ability to clearly communicate with co-workers and supervisors in distant parts of the facility. 3M™ Peltor™ Communications Products deliver the quality and performance needed for clear communication and hearing protection.

*3M recommendations are based on OSHA requirements and NIOSH recommendations. To learn more, visit: www.cdc.gov/niosh/topics/noise and www.osha.gov/SLTC/noisehearingconservation
Detecting noise sources and monitoring noise exposures in oil and gas operations are the first steps in identifying where hearing protection may be needed, and which workers need to be in a hearing conservation program.

**3M™ The Edge 5 Personal Noise Dosimeter**
Lightweight, shoulder-mount design with MSHA, SIRA (ATEX), CSA, and Simtars Intrinsic Safety Approvals.

**3M™ NoisePro™ Personal Noise Dosimeter**
Rugged design with features that allow workers to monitor noise exposure levels. Intrinsic Safety Certification with UL, cUL, MSHA, Ex, ATEX.

**3M™ Intrinsically Safe Sound Examiner SE-400 IS Series Sound Level Meter**
Accurately measures highly variable noise levels by computing average sound pressure level over run time.

**3M™ Detection Management Software (DMS)**
Works with all 3M Detection Solutions data logging instruments to easily configure, analyze data, and generate reports.

Protecting hearing and enhancing communication requires comfortable solutions with options that make it easy to select the right protection for every worker.

**3M™ Push-to-Fit Earplugs**
Easy fitting without rolling the foam tips makes them ideal for workers’ gloved and dirty hands.

**3M™ Disposable Earplugs**
Provide the best combination of protection and comfort for long work shifts.

**3M™ Reusable Earplugs**
Durable enough to withstand the rigors of the oil and gas environment, yet soft and comfortable. Washable earplugs can be reused many times, reducing waste.

**3M™ Banded Earplugs**
Easy on and off makes them perfect for workers who need only intermittent hearing protection.

**3M™ Peltor™ Optime™ Earmuffs**
Designed for comfortable wear in challenging oil and gas conditions. Multiple protection levels help provide the right protection for the job. Behind-the-head earmuffs work with most full brim hard hats.

**3M™ Peltor™ Earmuffs X Series**
Innovative foam earcup inserts help improve attenuation while new ear cushion foam technology helps provide a more effective acoustic seal against a variety of oil and gas production noise hazards.

**3M™ Peltor™ Lite-Com Pro II UHF Two-Way Radio Headset**
Hearing protection and frequency programmable two-way radio communication. Factory Mutual (FM) certified intrinsically safe. Behind-the-head earmuffs work with most full brim hard hats.

**3M™ Peltor™ ORA TAC In-Ear Tactical Communications Headset**
Combines hearing protection, ambient listening and two-way radio communication. Fits with most respirators, eyewear, face masks, helmets, and hard hats.

Training on the proper use of protection and measurement of attenuation levels can help you validate that your workers are protected.

**3M™ E-A-Rfit™ Validation System**
The E-A-Rfit validation system objectively measures the noise reduction obtained by individual workers and makes it easy to document how well each hearing protector performs. It can help determine the right level of protection for the job while training employees to properly fit their 3M™ earmuffs.

**Hearing Conservation Support**
At 3M, we understand the challenges of the workplace, the complexities of fitting hearing protection and the importance of creating adaptable solutions for maximizing hearing protection. The 3M team of application specialists and technical support personnel provides an unmatched level of support you can rely on to advance your hearing conservation program.