
INDUSTRIAL NOISE CONTROL
25 YEARS OF CONSULTING EXPERIENCE
OVER 2800 PROJECTS COMPLETED
6 PROFESSIONAL ENGINEERS
EXPERIENCE IN 25 COUNTRIES
44 STATES AND 7 PROVINCES
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THE HFP ENGINEERING GROUP
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INDUSTRIAL NOISE CONTROL SERVICES

NOISE EMISSION MEASUREMENTS AND TESTING
Diagnosing the source and extent of noise and vibrations problems. HFP has the expertise, techniques and equipment to precisely assess the cause and scope of any noise or vibration problem.

MITIGATION STRATEGIES AND RECOMMENDATIONS
Assisting the client to achieve solutions to noise problems in practical and economical terms. As an independent consultant, HFP ensures that the most appropriate and cost-effective solution is obtained.

COMPUTER NOISE MODELING
Developing an accurate understanding of specific noise problems using computer noise modeling programs to predict and map the propagation of noise on-site or off-site.

ENVIRONMENTAL NOISE SURVEYS
Performing long-term surveys to acquire defensible assessments of environmental noise levels.

OCCUPATIONAL NOISE SURVEYS
Conducting surveys of site conditions to evaluate occupational noise levels.

PERMITS AND APPROVALS
Regulatory requirements vary between regions and industries. HFP can assist clients to acquire the required permit or approval from regulatory bodies. HFP has specific experience with the regulations of FERC, Alberta EUB, OSHA, EPA, HUD, FHWA, Ontario MOE, NWT, and the World Bank.

ENVIRONMENTAL IMPACT ASSESSMENTS
Evaluating the impact of noise from proposed facilities to meet regulatory requirements, facilitate public consultations, and mitigate impact.

PUBLIC CONSULTATION AND DISPUTE RESOLUTION
Assisting clients to achieve amicable and workable relationships with communities and regulators through public consultations and presentations.

EXPERT TESTIMONY
Providing testimony that is recognized as experienced, educated, defensible, and of high integrity.

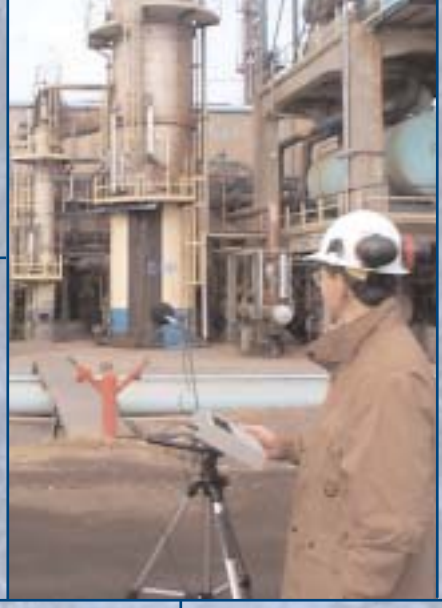
COMMISSIONING
Confirming that equipment has met its specified noise emission performance.

CLIENTS

GAS TRANSMISSION & OIL PIPELINES

- Alliance Pipeline
- ANR Pipeline
- B.C. Gas
- Canadian Western Natural Gas
- Canterra Energy
- Duke Energy
- Dynegy
- El Paso
- Express Pipeline
- Foothills Pipe Lines
- Florida Gas Transmission
- Great Lakes Gas Transmission
- Kinder Morgan
- Lakehead Pipeline
- Mackenzie Gas Project
- NGPL
- NOVA
- Northwest Pipeline
- PanEnergy
- PGT
- Pipeline Research Committee
- International - American Gas Association
- Southwest Gas
- Texas Eastern Transmission
- TransCanada Pipelines
- Union Gas
- Vector Pipeline
- Westcoast Energy
- Western Gas
- Xcel Energy

TECHNIQUES, EQUIPMENT & RESOURCES



COMPUTER NOISE MODELING

Using computer noise models HFP can generate color-contoured maps of noise levels that are ideal for illustrating noise impact and identifying areas that may be problematic. The models perform highly precise calculations that include the effects on sound of wall reflections, air absorption, ground absorption, barrier diffracation, wind, and temperature.

HFP can produce an order ranking of noise sources that is used to identify the extent to which particular sources of noise need to be addressed. This is critical for developing a noise mitigation strategy that is cost-effective and acoustically optimal.

Models can be developed for existing facilities by incorporating the results of diagnostic noise emission surveys. Models can also be built for proposed facilities during the design phase using a combination of manufacturer's specified data and HFP's extensive libraries.

HFP has extensive experience with multiple state-of-the-art noise modeling programs including Cadna/A, SoundPlan and custom developed software.

ENVIRONMENTAL MONITORING

Whether to determine regulatory compliance, establish a noise baseline, or track changes in community noise levels, HFP has performed a large number of community surveys, in residential as well as in remote and extreme environments. HFP can monitor noise levels continuously for weeks on-end and perform up to 10 surveys concurrently. Continuous audio recordings allow for post-survey analysis. Additionally, meteorological conditions, which have been proven to have dramatic effects on noise propagation, can be continuously monitored using HFP's weather stations. Graphs and other visual aids present results in a manner that is easily comprehensible.

SOUND LEVEL METERS

HFP has an extensive suite of equipment for measuring sound. This includes integrating sound level meters, multi-channel analyzers, digital recording devices, accelerometers, noise dosimeters, high temperature microphones, and sound intensity probes. HFP also has custom designed and calibrated equipment for measuring the noise from pipes and exhaust stacks which can dramatically reduce the cost of diagnosing noise emissions from these common sources of noise.

VIBRATION MEASUREMENTS

HFP has a great depth of experience in handling ground and structural vibration. Accelerometers and vibration meters measure vibrations from mining operations, railways, highways, HVAC equipment, rotating machinery and industrial process equipment. The analysis can investigate modal phenomena and non-linear responses. HFP tailors the solution to the exact nature of the problem.

EXPERIENCED CONSULTANTS

HFP has been a successful, independent acoustical consulting company for 25 years. We have a consulting staff of 15 and have a combined consulting experience of over 180 man-years in industrial noise control.

ENGLISH AND SPANISH

HFP is pleased to be able to offer services in English and Spanish.

CLIENTS

PETROCHEMICAL

- B.F. Goodrich
- BP
- Dow Chemical
- NOVA Chemicals
- Petrox
- Shell Chemicals
- Texas Petrochemicals
- Union Carbide

GAS PROCESSING & OIL REFINING

- AEC Oil & Gas
- Alberta Natural Gas
- Amoco Canada Petroleum
- Atlantic LNG
- BOC Gasses
- BP
- Canterra Energy
- Chevron
- Dome Petroleum
- Esso Resources Canada
- ExxonMobil
- Gulf Canada
- Husky Oil
- Imperial Oil Resources
- Mobil Oil
- PanCanadian Petroleum
- Petro-Canada
- Shell Canada
- Talisman Energy
- Texaco
- TotalFinaElf

HEAVY OIL & TAR SANDS

- CNRL
- Imperial
- Suncor

NOISE CONTROL STRATEGIES

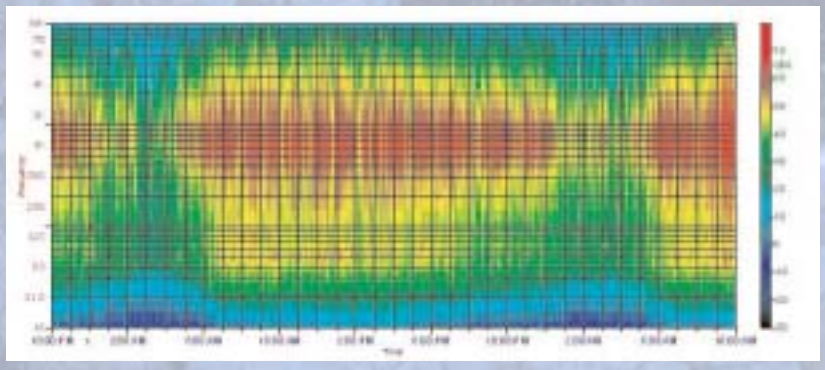
HFP NOISE CONTROL STRATEGIES

Developing an appropriate noise mitigation strategy requires not only an incisive understanding of acoustics, but also a full understanding of facility processes. HFP has developed this experience through its countless projects. HFP strives to integrate seamlessly into the process design team.

As an independent consultant, we are in the position to give clients unbiased advice as to the best form of noise control to meet their needs. Alternative strategies can be fairly evaluated.

HFP has an extensive library of vendors who supply noise control equipment such as:

- Silencers – engines, turbines, vents, ducts, and cooler fans
- Acoustical enclosures, buildings, acoustic blankets, barriers, and absorptive panels
- Acoustical pipe lagging
- Resilient pipe supports
- Low noise fans
- Quiet control values
- Vibration isolators



Once a mitigation strategy has been identified, equipment specifications are assembled and competitive bids from multiple vendors can be obtained. HFP assists clients when comparing bids to identify the one that will be most effective, in terms of both cost and performance.

It has been repeatedly demonstrated that the cost of installing noise control during construction can be as much as 90% more cost effective than retrofitting mitigation. It is always advantageous to develop a noise mitigation strategy at the design stage.

CLIENTS

POWER GENERATION

- Alberta Power
- EPCOR
- Enogex
- Hunt Power
- Koch Power
- PetroPower
- SaskPower
- TransAlta Utilities

MINING, MANUFACTURING, & OTHER INDUSTRIES

- Agrium
- ATCO Noise Management
- Cooper Energy
- CP Rail
- Fording Coal
- Ingersoll-Rand
- Lafarge
- Luscar
- Mafi-Trench
- Schlumberger
- Suncor
- United Steel Structures
- Weyerhaeuser
- World Bank

ENVIRONMENTAL & ENGINEERING

- AMEC Earth & Environmental
- Bantrel
- Bechtel
- Colt Engineering
- Delta Hudson Engineering
- Fluor Daniel
- Golder Associates
- Halliburton KBR
- Jacobs Engineering
- Jacques Whitford Environment
- SNC Lavalin
- Stantec
- Stewart & Stevenson
- Stone & Webster
- TERA Environmental
- UMA Engineering

OCCUPATIONAL NOISE EXPOSURE

HFP Acoustical Consultants provides employee noise exposure assessments in terms of regulatory and corporate guidelines. Where necessary, HFP can provide noise control treatment recommendations as needed to bring exposure into compliance.

OSHA NOISE STANDARDS

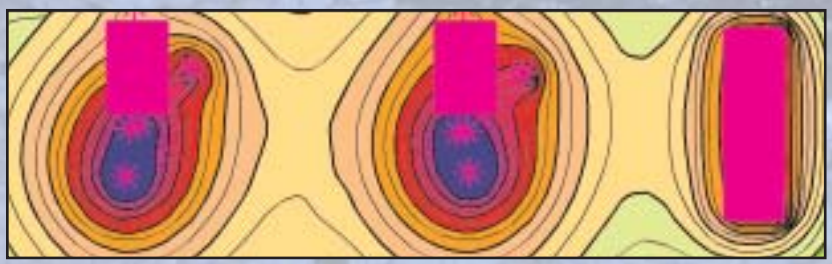
The Occupational Safety and Health Administration standard is the most commonly encountered industrial noise exposure guideline in the US. OSHA requires that a noise monitoring program be developed and implemented when information indicates employee noise exposure exceeds an 8-hour average exposure of 85 dBA. Noise monitoring must be repeated when changes in equipment or processes affect the noise exposure. Where needed, HFP can assist with the development, review, and administration of hearing conservation programs.

NOISE DOSIMETRY

HFP can conduct noise dosimetry measurements and/or analysis for workers to establish their level of noise exposure. Small data logging monitors are worn by employees as they perform their typical work functions. The monitors integrate the varying sound levels, weighting the decibel average in accordance with the time of exposure at each sound level.

AREA SOUND SURVEYS

HFP can also provide noise dose assessments based on area sound surveys. The data can be presented in terms of sound levels at workstations, and as color noise contours which reveal problem areas, areas requiring hearing protection, etc. This data can be used in conjunction with employee work locations and durations to assess exposure potential.



DIAGNOSTIC MEASUREMENTS

Where excessive noise hazards or noise exposure potentials are found, HFP can perform diagnostic sound measurements using specialized tools to separately quantify individual noise source contributions. This information can then be used to develop indoor noise models that illustrate the areas affected by noise sources with color contour diagrams. The predicted results with applied noise control treatments can similarly be modeled and illustrated.

NOISE TREATMENT PLANNING

HFP works closely with plant safety professionals and operations personnel to develop the safest and most cost-effective noise treatments, with due consideration for productivity and maintenance concerns.

CLIENTS

- Agrifos
- Anheuser Busch
- ARC
- Argent
- BASF
- Black Mesa Pipeline
- BOC Process Plants
- BP Chemical
- BP Green Ops
- Champion Coatings
- Cooper Industries
- Crown Petroleum
- Dominion Power
- Doubletree Hotels
- Dow Chemical USA
- Dow Canada
- Dow Europe
- Dresser Roots DMD
- Dynegy
- El Paso Corporation
- Ethicon/Johnson & Johnson
- Firestone
- GHX Inc.
- Grant TFW
- Halliburton-KBR
- Hughes Christenson
- Ingersoll Rand
- Johnson Construction
- Lepco Manufacturing
- Lockheed Martin
- Owens Corning
- Pavestone
- Phillips 66
- Plaas Inc.
- PolyOne Chemicals
- Schlumberger
- Selectron
- Shell Oil
- Stockhausen
- Thermo Onix
- Texaco
- Thomas and Betts
- Weatherford International