# Air Quality Permitting
# Statement of Basis

**September 12, 2007**

**Permit to Construct No. P-2007.0076**

**U.S Department of Energy, Idaho Operations Office (DOE-ID)**
**Idaho Nuclear Technology and Engineering Center, Idaho National Laboratory, Idaho Falls**

**Facility ID No. 023-00001**

**Prepared by:**

**Robert Baldwin, Permit Writer**
**Air Quality Division**

**FINAL**

# Table Of Contents

# Acronyms, Units, and Chemical Nomenclatures

| | |
|---|---|
| AIRS | Aerometric Information Retrieval System |
| AQCR | Air Quality Control Region |
| CO | carbon monoxide |
| DEQ | Department of Environmental Quality |
| EPA | U.S. Environmental Protection Agency |
| IDAPA | a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act |
| INL | Idaho National Laboratory |
| INTEC | Idaho Nuclear Technology and Engineering Center |
| $Km^2$ | square kilometers |
| lb/hr | pound per hour |
| $m^2$ | square miles |
| $NO_x$ | nitrogen oxides |
| NSPS | New Source Performance Standards |
| $O_3$ | ozone |
| PM | particulate matter |
| $PM_{10}$ | particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers |
| psig | pounds per square inch gauge |
| PSD | Prevention of Significant Deterioration |
| PTC | permit to construct |
| PTE | potential to emit |
| rpm | revolutions per minute |
| Rules | Rules for the Control of Air Pollution in Idaho |
| scfm | standard cubic feet per minute |
| SIC | Standard Industrial Classification |
| $SO_2$ | sulfur dioxide |
| TAPs | toxic air pollutants |
| T/yr | tons per year |
| $\mu g/m^3$ | micrograms per cubic meter |
| UTM | Universal Transverse Mercator |
| VOC | volatile organic compound |

## 1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, Rules for the Control of Air Pollution in Idaho, for issuing permits to construct.

## 2. FACILITY DESCRIPTION

Idaho Nuclear Technology and Engineering Center (INTEC) at Idaho National Laboratory (INL) is a restricted-access, government-owned facility that covers over 2,305 $km^2$ (890 $mi^2$) in southwestern Idaho.

## 3. FACILITY / AREA CLASSIFICATION

The INTEC is considered a support facility to the INL. INL is an existing major facility as defined in IDAPA 58.01.01.006.55 and 58.01.01.008.10. The AIRS classification is "A".

This facility is located in Air Quality Control Region (AQCR) 61 and UTM Zone 12. It is located within the boundaries of the INL and Butte County which is designated as unclassifiable for all regulated criteria pollutants ($PM_{10}$, CO, $NO_X$, $SO_2$, lead, and ozone).

**The AIRS information for this facility is not changed as a result of this permit revision; therefore, a revised AIRS Facility Classification form is not included in this document.**

## 4. APPLICATION SCOPE

INTEC has applied for this permit to change the COM-UTI-616 standby air compressor from an exempt source restricted to a maximum of 150 hours per month to a source requiring a permit to construct with an annual operational limit of 5000 hours per any consecutive 12-calender month period. The 5000 hours operational limit on the COM-UTI-616 restricts the oxides of nitrogen emissions to below the 40 ton per year significant level.

### *4.1 Application Chronology*

| | |
|---|---|
| May 3, 2007 | DEQ received the PTC application. |
| July 1, 2007 | DEQ declared the application complete. |
| July 26, 2007 | DEQ sent a draft permit to the regional office for review. |
| August 16, 2007 | DEQ sent a draft permit to the facility for review. |
| August 29, 2007 | DEQ received comments on the draft permit from the facility. |

## 5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC action.

## 5.1 Equipment Listing

The permit involves only the COM-UTI-616 compressor. The following is a description of the permitted COM-UTI-616 compressor:

- Type – Stationary rotary screw, oil-flooded compressor
- Manufacturer – Ingersoll-Rand
- Date Manufactured – February 1997
- Model number –XP-1400WCU
- Compressed air capacity – 1400 scfm at 115 psig
- Power source – Cummins diesel-fueled internal combustion engine
- Horsepower – 460 horsepower at 1,800 rpm according to manufacturer's data plate for the Cummins Model N14-C diesel engine

## 5.2 Emissions Inventory

This permit limits the $NO_x$ (the largest criteria pollutant emitted) emissions to 35.65 tons per any 12-calendar month period. The $NO_x$ limit inherently limits all other criteria pollutants emitted by the COM-UTI-616 compressor to below significant levels. A complete table of criteria pollutants emitted is located in Appendix A

## 5.3 Modeling

Estimates of ambient air quality impact in this application were based on EPA's air quality model AERMOD (ISC-AERMOD 2007). DEQ air quality modeling staff is accepting the submitted modeling analyses as "true, accurate, and complete," without additional agency review and/or verification analyses. A memorandum concerning the modeling submitted is located in Appendix B.

## 5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201 ..... Permit to Construct Required

The facility's proposed project no longer meets the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules. Therefore, a PTC is required.

IDAPA 58.01.01.203 ..... Permit Requirements for New and Modified Stationary Sources

The applicant has shown to the satisfaction of DEQ that the facility will comply with all applicable emissions standards, ambient air quality standards, and toxic increments.

IDAPA 58.01.01.210 ..... Demonstration of Preconstruction Compliance with Toxic Standards

The applicant has demonstrated preconstruction compliance for all TAPs identified in the permit application. The applicant has demonstrated that several air toxic pollutants are below their applicable screening levels. The few carcinogenic toxic air pollutants that exceeded the applicable emission levels were determined not to exceed their applicable ambient air concentration for carcinogens.

### 5.5 *Permit Conditions Review*

This section describes only those permit conditions that have been revised, modified or deleted as a result of this permit action. All other permit conditions remain unchanged.

5.1 Permit Condition 2.3 limits the $NO_x$ emissions from the COM-UTI-616 air compressor. $NO_x$ is limited below the significant level.

Compliance with the $NO_x$ emissions limit of Permit Condition 2.3 shall be demonstrated through installation of an hour meter and the monitoring of the operational hours required by Permit Conditions 2.6 and 2.9.

5.2 Permit Condition 2.4 requires that opacity limit on the compressor.

Permit Condition 2.4 is taken directly from IDAPA 58.01.01.625. Other than the sources listed in IDAPA 58.01.01.625.01, emissions from all stationary point sources in the state of Idaho are subject to the opacity standard; therefore, the COM-UTI-616 compressor stack must comply with this standard.

5.3 Permit Condition 2.5 limits the sulfur content in the fuel oil used by the COM-UTI-616 compressor.

Compliance with Permit Condition 2.5 shall be demonstrated with Permit Condition 2.8.

5.4 Permit Condition 2.6 restricts the operational hour of the COM-UTI-616 compressor to 5,000 hours per 12-calendar month period.

Compliance with Permit Condition 2.6 shall be demonstrated with Permit Condition 2.9.

5.5 Permit Condition 2.7 requires the permittee to have an operational hour meter for the COM-UTI-616 compressor.

Compliance with Permit Condition 2.7 shall be demonstrated with Permit Condition 2.9.

## 6. PERMIT FEES

INTEC submitted the application fee of $1,000 with the application on May 3, 2007.

A permit to construct processing fee of $5,000 was due as required in accordance with IDAPA 58.01.01.225, because the increase in emissions (not including fugitive emissions) associated with this PTC is greater than ten tons and less than one hundred tons per year. The $5,000 processing fee was received on September 4, 2007.

Table 6.1 PTC PROCESSING FEE TABLE

| Emissions Inventory | | | |
|---|---|---|---|
| **Pollutant** | **Annual Emissions Increase (T/yr)** | **Annual Emissions Reduction (T/yr)** | **Annual Emissions Change (T/yr)** |
| $NO_X$ | 35.65 | 0 | 35.65 |
| $SO_2$ | 2.36 | 0 | 2.36 |
| CO | 7.68 | 0 | 7.68 |
| $PM_{10}$ | 2.53 | 0 | 2.53 |
| VOC | 2.89 | 0 | 2.89 |
| TAPS/HAPS | n/a | 0 | n/a |
| Total: | **51.11** | 0 | **51.11** |
| Fee Due | **$ 5,000.00** | | |

# 7. PERMIT REVIEW

## *7.1 Regional Review of Draft Permit*

A draft permit was sent to the Idaho Falls Regional Office for peer review on July 26, 2007. No comments were received from the regional office.

## *7.2 Facility Review of Draft Permit*

A draft permit was sent to the INTEC on August 16, 2007. Comments on the draft permit were received from the facility on August 29, 2007. The comments consisted of addition information about the facility contact, responsible persons, a comment about the permit authority, and comments about some general provisions. The comments were addressed in the final permit.

## *7.3 Public Comment*

An opportunity for public comment period on the PTC application was provided from June 22, 2007 to July 6, 2007 in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application and no requests for a public comment period on DEQ's proposed action.

# 8. RECOMMENDATION

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommends that Idaho National Technology and Engineering Center at Idaho National Laboratory be issued a PTC No. 2007.0076 for the increase in operational hours of the COM-UTI-616 air compressor. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

REB/sd Permit No. P-2007.0076

# Appendix A – Emissions Inventory

# P-2007.0076

# Emission Inventory for COM-UTI-616

**COM-UTI-616 EMISSIONS LIMITS**

| Source Description | $PM_{10}$ | | $SO_2$ | | $NO_X$ | | VOC | | CO | |
|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr |
| Standby Air Compressor, COM-UTI-616 | 1.01 | 2.53 | 0.94 | 2.36 | 14.26 | 35.65 | 1.16 | 2.89 | 3.07 | 7.68 |

# Appendix B – Modeling Review

# P-2007.0076

*MEMORANDUM*

**DATE:** September 10, 2007

**TO:** Bob Baldwin, Air Quality Permit Writer, Air Program

**FROM:** Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

**PROJECT NUMBER:** P- 2007.0076

**SUBJECT:** Modeling Review for a Permit to Construct to modification the COM-UTI-616 standby air compressor located at the Idaho Nuclear Technology and Engineering Center (INTEC) at Idaho National Laboratory (INL) in eastern Idaho

INL proposes to increase allowable operations of the COM-UTI-616 standby air compressor from 150 hours per month to 5,000 hours per year. This will increase potential emissions to the following:

- $PM_{10}$ - 1.01 lb/hr for 24-hour averaging period and 0.58 lb/hr for annual
- $SO_2$ - 0.94 lb/hr for 3-hour and 24-hour averaging periods and 0.54 lb/hr for annual
- CO - 3.07 lb/hr for 1-hour and 8-hour averaging periods
- $NO_x$ - 8.14 lb/hr for annual averaging periods

Although emissions are well above modeling thresholds established by DEQ, the distance from the emissions source to ambient air receptors is very large and impacts from the source are expected to be very small.

A modeling protocol was submitted to DEQ on February 19, 2007. After reviewing proposed data and methods, DEQ issued a conditional approval on February 21, 2007.

Site-specific dispersion modeling analyses for the compressor were conducted by INL. INL used SCREEN3 to demonstrate compliance with all National Ambient Air Quality Standards (NAAQS) and Toxic Air Pollutants (TAPs) except $NO_2$. AERMOD was used for $NO_2$ because SCREEN3 indicated impacts above the significant contribution level. Final results indicated maximum increases in ambient concentrations resulting from operation of the compressor will be below significant contribution levels for all NAAQS and impacts of all TAPs will be below Acceptable Ambient Concentrations (AACs) of non-carcinogens and Acceptable Ambient Concentrations of Carcinogens (AACCs).

DEQ air quality modeling staff is accepting the submitted modeling analyses as "true, accurate, and complete," without additional agency review and/or verification analyses. This decision is based on the professional judgment of DEQ dispersion modeling staff, considering the nature of the emissions sources, the magnitude of the emissions, and the results from the submitted modeling analyses. Therefore, the ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard.