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DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

[Docket No. RSPA-04-18584; Notice 1]

Pipeline Safety: Controller Certification Pilot Program (CCERT)

AGENCY: Office of Pipeline Safety (OPS), Pipeline and Hazardous Materials Safety Administration (PHMSA), DOT.

ACTION: Notice; Controller Certification Pilot Program

SUMMARY: This notice seeks participants and provides information about the certification study project affecting individuals who operate computer-based systems for controlling the operation of gas and hazardous liquid pipelines (pipeline controllers) and the associated pilot program required by Section 13(b) of the Pipeline Safety Improvement Act of 2002 (PSIA). This notice describes the purpose and scope of a project being undertaken by the Pipeline and Hazardous Materials Safety Administration's (PHMSA) (formerly the Research and Special Programs Administration) Office of Pipeline Safety (OPS) to determine what actions it should recommend for additional assurance that individuals who operate computer-based systems for controlling the operation of gas and hazardous liquid pipelines are adequately qualified and, if deemed necessary, certified to perform their job responsibilities. The public is invited to inquire

about this project through the contact information below, and is encouraged to provide comments.

FOR FURTHER INFORMATION CONTACT:

Byron Coy, (telephone: 609-989-2180; E-mail: byron.coy@dot.gov) regarding the subject matter of this notice. Additional information about this notice can be accessed in the docket captioned above on the DOT Docket Management System website at: http://dms.dot.gov.

DATES:

Persons interested in participating in the pilot program or submitting written comments on the controller certification overall project or the pilot operator program should do so by [INSERT DATE 30 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES:

For access to the docket to read background documents or comments, go to http://dms.dot.gov or to Room PL-401 on the plaza level of the Nassif Building, 400 Seventh Street, SW, Washington, DC, between 9 am and 5 pm, Monday through Friday, except Federal Holidays. You may submit written comments to the docket by any of the following methods:

- Mail: Dockets Facility, U.S. Department of Transportation, Room PL-401, 400 Seventh Street, SW, 20590-0001. Anyone wanting confirmation of mailed comments must include a self-addressed stamped postcard.
- Hand delivery or courier: Room PL-401, 400 Seventh Street, SW, Washington, D.C. The Dockets Facility is open from 9:00 am to 5:00 pm, Monday through Friday, except Federal holidays.
- Web site: Go to http://dms.dot.gov , click on "Comments/Submissions" and follow instructions at the site.

All written comments should identify the docket number and notice number stated in the heading of this notice.

BACKGROUND:

Over the past eight years, 10 of the 18 pipeline incident/accident investigations conducted by the National Transportation Safety Board (NTSB) have identified controller's actions or reactions, or the computer systems they use, as significant factors in detecting or contributing to the initial event, influencing reaction time or affecting the magnitude of an event. Controllers are individuals that use computers to control pipelines. Section 13(b)(1)(A) requires PHMSA to "develop tests and other requirements for certifying the qualifications of individuals who operate computer-based systems for controlling the operations of pipelines."

For the purposes of this overall project, tests refers to the examination and evaluation of: (a) current operator training and qualification processes and practices (through the pilot operator

program), (b) current regulations, (c) industry standards, including ASME B31Q, and (d) program development, practices, and requirements for control room operating personnel that are applied in other industries.

Section 13(b)(1)(B) requires PHMSA to "establish and carry out a pilot program for 3 pipeline facilities under which the individuals operating computer-based systems for controlling the operations of pipelines at such facilities are required to be certified under the process established under subparagraph (A)." Further, Section 13(b)(2) requires PHMSA to develop a report to Congress on the results of the pilot program that includes recommendations on the certification of pipeline controllers.

Overall Project Objectives

This overall project will explore whether current regulations are sufficient to address the findings resulting from these accidents and other project development activities or whether regulations need to be enhanced to provide additional controller qualification requirements. The overall project will also determine whether a certification process for controllers is warranted.

The objectives of the overall project are to:

- Define and document current practices and processes that pipeline operators use to determine that controllers have adequate knowledge, skills and abilities to perform their assigned tasks.

- Evaluate and determine what practices and processes best serve to substantiate that individual pipeline controllers have adequate knowledge, skills and abilities to perform their assigned tasks.
- Determine what evaluation techniques, criteria, and validation frequency can most effectively demonstrate proficiency.
- Define what administrative procedures, records, and certification criteria can best serve to demonstrate the aforementioned objectives.
- Determine how specific or uniform such practices, process content, evaluation parameters, and administrative procedures are across the various types of pipeline operators.
- Determine the adequacy of the existing operator personnel qualification requirements for controllers, in light of the significant impact they can have on pipeline safety and integrity.
- Develop conclusions and establish recommendations to be reported to Congress at the end of the project.

Overall Project Strategy

OPS experience, supplemented by consultation with a specifically assembled focus group, and a variety of operator interviews conducted at the beginning of this project have all validated that qualification practices for controllers among pipeline operators vary greatly. These differences are based on pipeline characteristics and varying operational needs. Even within each operator type [gas transmission, local distribution companies (LDC), hazardous liquids, liquefied natural

gas (LNG)], there are varied and sometimes unique safety-sensitive job tasks that controllers are expected to perform. These differences would make it difficult to develop a substantive universal test to qualify controllers. Thus, a uniform controller evaluation/certification test for the entire industry would likely not address many operator-specific and sometimes unique tasks critical to pipeline integrity and safety.

To provide a higher assurance that controllers possess adequate knowledge, skills and abilities, the project team will be focusing on the content of the pipeline operators' administrative, training and evaluation techniques that make up the controller qualification process. Each operator should have a controller qualification program that is specifically designed to address the particular attributes and needs of its pipeline. The project team will recommend a specific set of topic areas and content with a level of adequacy and thoroughness expected of an operator's qualification program and associated administrative processes. Project recommendations will address criteria to determine adequate material content, a structured and encompassing qualification process, and thoroughness and adequacy in an operator's training, performance monitoring and periodic evaluation activities. Each of these elements is discussed below.

Description of the Project Scope

PSIA-2002, Section 13(b) specifically uses the phrase "persons who use computers to control pipelines." Section 13(b) implies that an elevated risk to the public would result from ineffective

qualification of persons who use computers to control pipelines. The Act does not specifically identify or exclude any type of pipeline based on its operating pressure, degree of sophistication, pipe mileage, or how computers are used to control the pipeline system. Since the application of computer technology is prolific, sophisticated computer control systems (SCADA) have now been deployed in a wide variety of applications, including individual remote stations, thereby defining the range of the project beyond the traditional Supervisory Control and Data Acquisition systems (SCADA) control room.

SCADA systems are used extensively in the pipeline industry. These systems provide a means for controllers (an individual or team) to monitor and control pipeline stations and other facilities. These systems can provide remote control over great distances. Application of SCADA systems has resulted in a reduction of pipeline field staffs, making the role of the controller critical to safety and integrity in pipeline operations. In cross-country hazardous liquid and gas transmission pipelines, controllers routinely monitor and send commands to change flow rates and pressures. Prompted by an assortment of factors, hazardous liquid and gas transmission pipeline controllers are re-directing flow, starting and stopping pipeline segments or adjusting flow rates to accommodate market conditions, maintenance activity and weather on a regional or sometimes national basis. For these types of pipelines, dynamic operating conditions require controllers to have a high level of knowledge, skills and abilities to safely maintain systems and promptly recognize operating anomalies and abnormal conditions as they develop.

Although the formal pilot program will place an emphasis on gas transmission and hazardous liquid pipelines, OPS will be able to address all of the following groups in the context of the project report and recommendations:

- Gas transmission pipeline controllers
- Hazardous liquid pipeline controllers
- Pipeline controllers who reside in gas compressor and hazardous liquid pump stations
- Pipeline controllers who reside in LNG facilities, to the extent they control pipelines
- LDC pipeline controllers

The work of this project will then include consideration for the qualification and potential need for certification processes related to this broader set of pipeline controller personnel. OPS acknowledges the differences in operating hydraulics and the role of controllers between hazardous liquid and natural gas pipelines, and will take these differences into consideration during the development of the project and the eventual recommendations.

Identification of the Focus Group

A Focus Group of stakeholders was established early in the project, including representatives of the public, industry trade associations, pipeline operators, state pipeline safety agencies, academia and OPS. Discussions with the Focus Group provided insight regarding key operational and logistic considerations for the project. Information came directly from the Focus Group participants and subsequently from members of their respective constituencies. In addition, project updates have been presented at several trade association meetings, where

additional feedback was attained. OPS will continue to use the Focus Group throughout the term of the project.

Accident and Incident Review

Preliminary review of the NTSB incident/accident data indicates that more detailed information regarding a controller's functions could be collected as a part of accident and incident reporting, to permit a more definitive analysis of controller involvement. Such additional information would support a more thorough review in future analysis. There are many other events for which reporting is not mandated by current regulations, such as upset conditions, near-miss events, situations that were averted by the operation of safety systems and other operating anomalies that did not reach current reportable thresholds. The tabulation and analysis of such events could provide additional information to support a more thorough controller performance review, metrics analysis, targeted or enhanced training and general pipeline safety and integrity improvements. This additional information could also be used to determine and/or substantiate the adequacy of current controller qualification programs.

Survey of Industry Practices

OPS met with a broad cross-section of pipeline operators in the fourth quarter of 2003 to learn what pipeline operators are currently doing to meet existing operator qualification requirements for controllers. OPS will be meeting with representatives of other industries, additional pipeline operators and research organizations during the course of the project to gather an expanded set of

information that will help develop and substantiate the recommendations and conclusions of our report. The industry visits conducted to date are tabulated in the docket.

As a result of these visits, pipeline control functions have been categorized. Currently, principal control function categories are defined as: full remote control, detect/monitor/direct field operations, and detect/monitor/defer to field operations. In each case, controllers were using computers to detect and monitor operations and then either perform control functions themselves or direct or advise field operations of needed attention based on the controller's responsibility, authority and assessment of the situation. These control function categories were developed to more clearly separate operators into controller function groups.

Participation in B31Q (National Consensus Standard on Pipeline Personnel Qualification)

OPS recognizes the ongoing effort to develop a more thorough, consensus-based standard for gas and hazardous liquid pipeline personnel qualification programs. The American Society of Mechanical Engineers (ASME) is now engaged in the development of a national consensus standard entitled ASME B31Q, "Pipeline Personnel Qualification Standard." It is anticipated that this standard will include qualification requirements for pipeline controllers who are performing tasks influencing pipeline safety or integrity. It will also incorporate a set of management practices intended to ensure that personnel qualifications will be maintained so that they remain current, and consistent with tasks performed. The completion of ASME B31Q is imminent. Should ASME B31Q be completed within the time frame of the Controller Certification project, there may be an opportunity to select one or more operators to demonstrate

and test applicable elements of the B31Q's controller-related qualification requirements during the pilot program.

Investigation of Controllers' Interaction with Computers:

This project will also examine the interface and data presentation characteristics of the computer systems that controllers use to operate pipelines. This work will be supplemented by reviews of other industrial control room settings. PHMSA/OPS acknowledges that this area is beyond traditional personnel qualifications, but has identified that this areas should be addressed as an aspect of the Congressional recommendations and report due at the conclusion of this project. A review of the adequacy and presentation of data through the computer system will be limited to those areas that may affect the controller's ability to accurately recognize and promptly react to abnormal operating conditions, or those other conditions that may lead to abnormal operating conditions. Specific areas of interest are not necessarily limited to:

1. Access to sufficient pipeline system information
2. Accuracy of the information provided
3. Color pallet and number of colors used to convey information
4. Interaction and navigation within the control system displays
5. Initiation of controller commands
6. Security from unauthorized commands and control
7. Alarm and event configuration and management
8. Recognition of control system degradation
9. Alternative means of system monitoring and control in times of system failures

10. The conditions surrounding the testing of alternative means of system monitoring and control.

Pilot Program

The PSIA directs that three operators be selected to formally participate in the pilot program. The pilot program will be conducted from the 2nd quarter of 2005 through the 1st quarter of 2006. Information gathered during the industry survey indicated that many local distribution company controllers advise and defer action to district field operations personnel for needed control adjustments. Therefore, the pilot program will focus on hazardous liquid and gas transmission pipelines, and will not include an operator who is solely a local distribution company. In addition to the three formal pilot participants, additional operators of all types will be contacted informally to provide supplemental information on practices, processes, procedures and standards that are used, or could be used to demonstrate controller qualification thoroughness and effectiveness. The similarity of some controller function across all operator types will allow certain portions of the report and recommendations to address all pipeline operators.

The purpose of the Pilot Program is to: (1) evaluate the effectiveness of the practices and administrative processes currently used by operators in the qualification of controllers; (2) review training programs, qualification requirements, evaluation methods, evaluation criteria, success thresholds, and re-evaluation intervals to determine their adequacy and thoroughness in the controller qualification process; and (3) explore how these processes and evaluation criteria could be

used to develop uniform protocols and acceptance criteria for the certification of pipeline operators' controller qualification processes. The pilot program will be used to examine and evaluate:

1. Operators' procedures and practices for Operator Qualification (OQ) regulations for pipeline controllers, including evaluation practices and frequency, and other regulatory requirements.
2. Methods and metrics employed to measure and document ongoing individual controller performance.
3. Operator studies or research (past or present) related to controller qualifications, performance metrics or other related topics.
4. Measures in place to monitor individual controller performance between formal periodic evaluations.
5. Benefits anticipated from voluntary candidate changes or enhancements to controller qualifications requirements
6. Administrative processes used to pre-screen potential controllers, processes to suspend, revoke and restore a controller's job assignment, and documentation to substantiate ongoing qualification adequacy.

OPS invites pipeline operators to volunteer to participate in the pilot program. Participation of pilot program operators will include on-site observation by OPS representatives as further described in this notice, and will also include discussions regarding the development of project recommendations. Operators wishing to participate in the pilot must submit descriptions of the controller qualification processes and systems they are using to validate the training and

proficiency of their controllers. Operators may also include a brief description of any new techniques that they may wish to initiate and evaluate during the course of the pilots. OPS will review candidate submissions to determine which three best serve the objectives of the project. Operators wishing to participate in the pilot program must submit information outlining the systems and processes used in their controller qualification program by [INSERT DATE 30 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]. Details outlining the submittal process are further explained in this document and in the docket.

During the pilot program period, OPS will monitor and evaluate programs of the selected pilot operators to determine the value that specific practices would add to an adequate qualification program, and possibly a certification process. The pilot program will not include operator qualification inspections of the pilot operators. OPS will have an active dialog with the pilot operators on an ongoing basis, review preliminary pilot findings with each pilot operator, and seek their additional input before developing conclusions and recommendations for the final report to Congress. Estimates of maximum operator man-hour requirements for the pilots are included in the docket.

OPS will also be studying research findings and will review existing qualification and certification processes that are employed or have been considered for aircraft pilots, aviation flight controllers railroad engineers and train dispatchers. Other industries where requirements and operating practices have similarities to pipeline controllers may also be identified and reviewed.

In conjunction with the pilot program, the overall project team will review recent incident and accident data to assure that the activities of the pilot program and subsequent recommendations include recognition of lessons learned from those events that may have been attributed to, or aggravated by, controller involvement or lack of action. This review will encompass a review of OPS records and NTSB reports and recommendations. Control room personnel evaluation, administration, certification and performance monitoring practices employed for Federal Aviation Administration (FAA) Air Traffic Controllers and Federal Railroad Administration (FRA) Rail System operations will also be studied.

As required by PSIA, the resulting recommendations and other criteria will be prepared as a final report and submitted to Congress in December 2006. The report will focus on pipeline operators' administrative and procedural processes that are, or could be, employed to provide an elevated assurance that controllers possess adequate knowledge, skills and abilities. The report may conclude that existing or pending regulations and/or industry standards are adequate to ensure qualified controllers, or that current regulations and/or industry standards are not sufficient and additional measures are needed. The report may also conclude that further study should be applied in certain topical areas.

OPS will summarize the pilot results, merge other project findings into the project report, and submit the report to Congress by December 17, 2006, as required by the PSIA.

The docket provides additional information regarding the pilot program. Candidate pilot operators must be regulated under 49CFR Parts 192 and/or 195. A data form has been developed

to assist candidate operators in providing sufficient information to OPS regarding pilot operator volunteers; this form is available in the docket.

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Issued in Washington, D.C. on _____.

Theodore L. Willke,

Deputy Associate Administrator for Pipeline Safety