

TECHNICAL REPORT

ANSI/ISA–TR77.70.01-2010

ANSI Technical Report prepared by ISA

Tracking and Reporting of Instrument and Control Data

Approved 3 October 2010

ANSI/ISA-TR77.70.01-2010
Tracking and Reporting of Instrument and Control Data

ISBN: 978-1-936007-58-5

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Foreword

In order to manage plant operations in a safe, cost-effective and productive manner, it is imperative that plant personnel are able to access, manage, and report on I&C equipment data. This requires an environment where appropriate software tools, processes, standards, and governance measures are in place to help enable effective plant operations. Access to quality data with a user-friendly system that facilitates recording, maintaining, and standardizing data helps contribute to safe working conditions, minimized plant equipment down time (planned and unplanned), extended equipment life, and fulfilled power demand.

ISA TR77.70.01 describes a database application (for use in power plants or other type plants) that provides a central repository of non-operational instrumentation and control system data, such as tag names, instrument type, instrument location, circuit identification, cable-routing, DSC system identifier, and many more. Together, this data provides users all of the information needed to research and troubleshoot many issues at each user's fingertips.

The application has proven to be an invaluable tool for researching and troubleshooting plant-related problems in a safe, efficient, and cost-effective manner on many occasions. Prior to the development of the application, I&C technicians had problems accessing quality information (including I&C equipment data, prints and documents, work orders, etc.) which can lead to unsafe and inefficient work conditions. Research could take hours, days, and even weeks for certain problems, as data was not always electronic, centralized, secure, up to date, or accurate. With the advent of this application, personnel have electronic access to I&C equipment data, allowing them to quickly and safely identify and solve root-cause problems, resulting in less equipment down time.

In addition, plant personnel are able to easily produce reports for circuit schedules, instruments, loop data, daily maintenance, calibrations, state certifications, and audit schedules. Plant use of this application ensures avoidance of many past problems encountered by I&C technicians. Past record-keeping problems will be reduced because personnel are required to update the data in the application before any plant work can be completed. When prints are updated, they become available to the field immediately, increasing safety and decreasing troubleshooting time. The application provides a foundation to continuously improve upon the quality and availability of I&C equipment data.

This document addresses the functional requirements to achieve the integration of plant technical data into easily accessible storage, convenient for use by operation and maintenance (O&M) personnel to manage plant data. These functions need to be written into contracts for new or existing facilities so that data is presented to owners by architect/engineers or other outside firms in formats, or indeed, data applications that meet the needs of the O&M staff for using plant-design data to maintain these facilities.

Figures included in Annex C are an example of one possible implementation of the application.

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Abstract

This report describes a methodology for the development of an application for tracking and reporting of instrument and control data in a timely manner, including a complete plant instrument index and including an equipment form, a calibration form, a report menu, a critical trip report, a DCS search engine with supporting DCS loop form and DCS report form, a circuit and raceway application, including forms for cable information, raceway information and report menu, and a line-book application. The functions discussed detail the necessary features for a power-generation instrument and control application and should be used for guidance in the user development of an application for tracking and reporting of instrument and control-equipment data.

Key Words

Technical Report, Application, Document Management System, Data, Distributed Control System, Instrument, Work and Asset Management System, Report, Tracking

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1 Scope

This technical report provides guidance in the design and function of a method for instrument tracking and documentation control that is adaptable for use by multiple plants and is compatible with many of the available plant-site-distributed control systems. The report addresses methods to develop a user-friendly interface that allows instrument technicians and electricians easy access to instrument-and-control-drawing information (loop, electrical and connection), cable schedules, piping-instrument documents, and work-practice procedures.

This technical report addresses methods linking a document management system with a work and asset management system. These links eliminate the time to manually search for plant drawings, manuals, or critical documents. Convenient access is included to daily maintenance, calibrations, state certifications, audit schedules, instrument-outage-calibration-list reports, and options for detailed reports.

2 Purpose

The purpose of this technical report is to provide advice and guidance in the development of methods to address the common issue of tracking, troubleshooting, and reporting instrument and control (I&C) equipment data in a standard format.

3 Definitions

Document Management System (DMS) – a system that electronically manages drawings, documents, and manuals throughout the lifecycle of the plant.

Distributed Control System – a control system, usually of a manufacturing system, process, or any kind of dynamic system, in which the controller elements are not central in location (like the brain) but are distributed throughout the system with each component sub-system controlled by one or more controllers. The entire system of controllers is connected by networks for communication and monitoring.

Fossil-Fired Power Plant – a power plant that burns fossil fuels, such as coal, natural gas, or petroleum (oil) to produce electricity. Fossil fuel power plants are designed on a large scale for continuous operation. In many countries, such plants provide most of the electrical energy used.

Work and Asset Management System (WAMS) – a strategic asset and service management system that runs on a number of databases. The WAMS is used to track work processes, including preventative maintenance (PM) tasks, hours worked, and assets, such as pieces of equipment.

4 Abbreviations (Acronyms)

CAE- Computer Aided Engineering
CR- Circuit Raceway
DCS- Distributed Control System
DMS- Document Management System
I&C- Instrument and Control
IOCL- Instrument Outage Calibration List
PM- Preventative Maintenance
WAMS-Work and Asset Management System