CHAPTER 35

Use of Online Document Management Systems (DMS) for Projects

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Abstract. *This article focuses on the projects Information Management System (IMS) and the online document management system (DMS) for the live projects. This article explains in depth about method of capturing the metadata and other detailed information about the sources in the live projects. The Information Management System for projects is one of the important activities and the success of some projects depends heavily on this system. Also it is evident from the explanation in this article that the role of documentation during and after the project life cycle.*

Keywords: DMS, IMS, Project Management, Aconex, Metadata, Attributes

1. Introduction

The seemingly endless and ever increasing volume of information has circulated about a project. To the tracking of changes to a design as it passes from the designer, to the architect, to the Detailer, to the contractor and back again. Technology hasn't eliminated paper. It has likely created even more. On average, an individual worker maintains 20,000 paper documents each year and spends 50 percent of his/her time managing those documents. Not only can potential mismanagement of information cost to the projects time and money, the ways in which we keep our projects and company's information secure yet accessible.

In recent years new developments in project information & document management have been enacted. The increase identity and intellectual property theft, has forced businesses to look more closely at their information management processes. Information Management System (IMS) is to capture, store and retrieve for its relevant expertise, industry knowledge and financial benefits.

The Indian power sector or the power industry in India comprises of the various governmental bodies looking after the power systems in India, power generation industry and technologies in India, power supplies, power industry report showing the analysis of the power scenario in India, the Indian power requirements and shortage, the various Indian power supply unit and the power infrastructure in India. The Power & Energy Infrastructure sector in India is poised for a major take-off. The APDRP (Accelerated Power Development & Reforms Programme 2002 - 2012) has seen an addition of around 22,000 MW during last five years. And during the next five years, a capacity addition of over 78,000 MW has to be set up by 2012. (A commitment of 15,600 MW capacity additions per annum).

Information Management System (IMS) is a system or process that provides the information necessary to manage the Project effectively. The importance of maintaining a consistent approach to the development, use and review of IMS system within the Projects is an ongoing process. The IMS system in Project must have a clearly defined framework of guidelines, policies, standards and procedures.

2. Project Information Management System

Project information management is carefully planned and organized efforts to accomplish a specific one-time effort in constructing a thermal power plant. Project information management starts with the developing a project plan, which includes defining project goals and objectives, specifying tasks or how goals will be achieved, what resources are need, and associating budgets and timelines for completion.

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The information Management Lifecycle can be defined in terms of the following steps:

- Definition of requirement for Document. This is sometimes called "*deliverables*" for information Management
- Document Creation
- Review and Approval by Information Management team
- Distribution of Document as an approved working copy
- Subsequent document revision
- Re-distribution of revised document to the original distribution matrix
- Disposal or archival of superseded information

Capabilities	***Benefits***
Maintain a master Information document register of the latest revision of all project documents/drawings.	Increased productivity for Document Controllers compared with maintaining spreadsheets.
Generate transmittals and maintain and audit trail of who was sent what and when.	Increased productivity compared with typing transmittals and reduced plan printing costs via e-transmittals.
Manage revisions to information documents with an automatically maintained document history.	Reduced risk by auto maintenance of an audit trail of all incoming and outgoing information sources
Automatically identify who has not been sent the latest revision of Information sources.	Reduced re-work arising from working to out of date information.
Ensure recipients are transmitted the latest revision of each information sources.	Reduced disputes arising from incorrect issues of information sources.
Manage the document/drawing review process, Internal and External.	Shorter review cycles for document/drawing approvals.
Expedite the responses to document/drawing issues using QDMS Alerts.	Minimize design delays due to slow document reviews/approvals.

3. Importance of Information Management

Information Management is an important Project Management function. The implementation of good Information management practices will benefit the project in many ways:

- Improves the conduct of business in an orderly, efficient and accountable manner.
- Supports compliance with Quality Assurance standards.
- It protects the interests of the Company and the stakeholders in the project
- It significantly reduces the chance of cost blowouts, caused by working with superseded documents.
- It promises tangible savings in time and resources through the use of a common system that is used by the entire project team with efficient search and retrieval functionality.

The adoption of a best practice system for the management of Information that enables full auditing of Information from creation to archival is an important project management function. A framework for good quality control by the Information Management team is the resulting objective.

It is also important to note that all of the above types of Information are likely to be revised and re-issued by the information management team.

The capabilities and benefits of the Information Management System can be identified as;

The size of projects varied from less than £5,000 up to hundreds of millions. Generally projects members have to use the same information management systems on all projects with some of the smaller projects using a scaled down

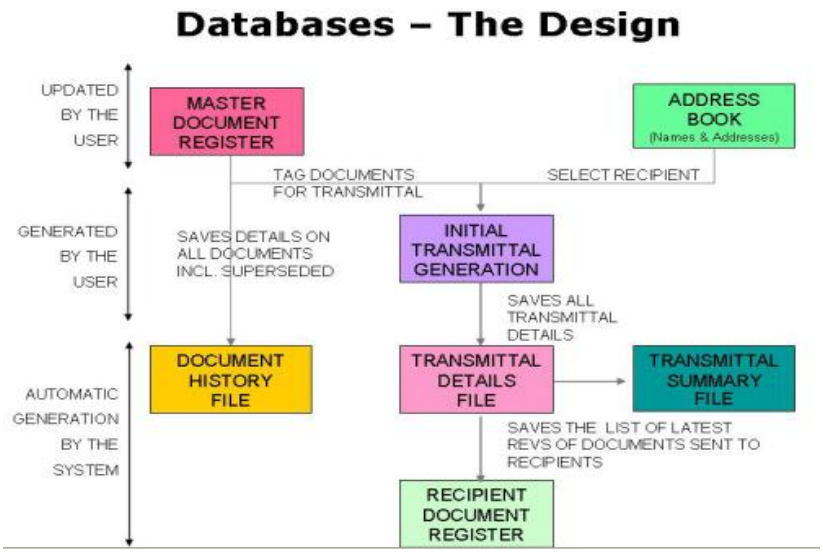
version. The implementation of an information management system not to be based on the risk involved in the project. If anything, it was based on the size. The consistency of use of any particular system appeared to vary depending upon the project requirements and was often dependant upon the project team or the client.

4. Aconex: Tool For Information Management

Aconex is an online application system, which is accessed by users via the Internet. Aconex provides a simple effective web-based system for organizations to collaborate and share information. Aconex provides a mean of transmitting, recording, managing, controlling and tracking this information during the complete life cycle of the project – through feasibility, design, construction and facilities management. The Aconex system assists the clients to increase efficiency, save administration time, reduce costs and mitigate risks.

Aconex provides a fully integrated document and information management tool including:

- An automated document register
- Fully tracked correspondence management
- Detailed reporting facilities
- Process and document approval workflows
- Approvals, preferences and other company administrative tools



4.1 Features of Aconex

The Aconex system provides efficiency gains and cost savings including:

- Reducing administration time
- Reducing the cost of document control and distribution
- Reducing time and costs involved with managing correspondence and tendering
- Increasing the Organization's ability to monitor project progress more efficiently
- Centralizing information management
- Eliminating communication errors
- Reducing the volume of document printing, couriers and faxes
- Improving the process of tracking and audit trails thus reporting the information on the project
- Eliminating multiple entry of data within and between companies
- Eliminating loss of information
- Minimizing commercial risk

- Alleviating disputes with a full audit trail of all documents, revisions, dates etc.

4.2 Disciplines List

These disciplines are relevant to Document Registration and Tracking. Please note that this is a mandatory field.

Discipline Title	Acronym	Application / Use
Civil	CV	For documents relating to civil engineering
Electrical	EL	For documents relating to electrical design and installation
Environmental & Safety	EN	For documents relating to environment related issues
Mechanical	ME	For documents relating to mechanical design and installation
Instrumentation & Control	IC	For documents relating to instrumentation and control design
Chemical	CH	For documents relating to chemical engineering
Information Technology	IT	For documents relating to the IT division of MPC
Procurement & Contracts	PC	For documents relating to Procurement & Contracts
Finance	FN	For documents relating to invoicing and approval/release of funds
Administration, BD & MIS	AD	MIS, Project monitoring and all reporting system
Commissioning & Performance testing	CP	All activities/purchase done during commissioning & performance testing
Marketing	MK	For documents relating to marketing division of divisions of BHEL
Others(Please specify)		

4.3 Primary Attributes (Zoning)

The Following Project Attributes Are To Be Used For The Tagging Of Mail And Documents To Ensure Information Is Stored In An Ordered Fashion. This Will Ensure Easier Retrieval Of Information Quickly And Effectively In The Future.

Zone/Location Description	Acronym	Description
Steam Generator & Auxiliaries	SGA	All equipments, valves, piping, Electrical, I&C, ESP, and associated equipments
Steam Turbines & Auxiliaries	STA	Turbine, controls valves, Lube oil system, surface condenser and associated equipments
Generator & Auxiliaries	GNA	Generator, Exciter, connected auxiliaries
HP & LP Piping	HLP	Valves, controls and piping in HP&LP Bypass system, APRDS, Auxiliary steam system and piping plant wide
Fuel Oil, Coal Mills & Associated handling system	FHS	Complete coal mills and coal mill handling system, Fuel oil system and connected auxiliaries.
Ash Handling System	AHS	ESP and other equipments in this system
Sea Water Cooling System	SCS	CW Pumps, piping, valves, surface condenser and equipments
Air & Flue Gas system	AGS	Fans, ducting, damper in air and flue gas path
Feed Cycle & Condensate System	FCS	Hp Heaters, LP Heaters. BFP, CEP, Condensate pumps, Gland steam condenser and piping
ACW & Compressed Air system	ACS	Pumps, piping and auxiliaries in this system
Electrical system	ELS	All AC & DC electrical panels, transformers up to 6.6kV, lighting, Emergency DG Set, UPS, Batteries
Switchyard	SYD	Step-up transformer, SST,UAT and 220KV switchyard

Zone/Location Description	Acronym	Description
Miscellaneous	MSC	EOT cranes, Lifts, Tanks, Fire Fighting, Air conditioning and ventilation, Chemical dosing system
BD Documents, Reports & Monitoring	BRM	Material status, BD documents, MIS & all other reports.
FGD System	FGD	All equipments, piping and support structures in FGD system
C & I (Common)	CIC	C&I common to a all the facilities
Civil Infrastructure	CIN	Common infrastructure in the plant
D M Plant	DMP	All equipments related to Demineralisation plant

4.4 Project Documents

Documents will need to go through for Review & Approval, so it is important that they are Registered and Transmitted. Any attachment to a Transmittal, from the Controlled Documents Register, gets automatically registered on the recipients' document register by default and could be customized to meet the needs of the Organization.

4.5 Document Type

These document disciplines are typically selected by each participating organization to suit their scope and needs of the project.

The document types given below relates to the Project user configuration.

Document Types	Acronym	Application / Use
Applications/Permits/Licences	APL	For documents seeking permits and licences
Arrangement and Layout Drawings	ALD	For general layout drawings
Accident Reports	ARE	For all accident reports from the site
Bills & Payments	BNP	For all bills and payments to be cleared by the finance section
Correspondence/Approvals and others with Statutory Bodies	CST	For documents related to the correspondence with statutory and regulatory bodies
Cable Schedule	CSC	For all types of Cable Schedules
Cable Interconnection Schedule	CIC	For all types of Cable interconnection points
Checklist	CHK	For Inspection, commissioning etc
Commissioning Instructions	CIN	For documents with commissioning instructions
Commissioning Reports/Results	CRE	For documents on commissioning reports/results
Completion Certificate	COC	Equipments and scope/part of the scope completion certificate issued by the vendor
Data Sheets	DAT	For documents related to equipment and unit calibration and plant wide plant and equipment data sheets
Handover	HDR	For documents related to equipments and scope/part of scope handed over by vendors
Drawing (General Arrangement)	DWG	For all types of GA drawings
Drawing (PFD)	PFD	For all types of PFD drawings
Drawing (P&ID)	PID	For all types of P&ID drawings
Contract Documents	CDC	For all types of contract documents
Punch List	PUN	For documents on Snag or Defect list during construction
Environmental Impact/Management	EIM	For documents relating to Environmental Impact and its mitigation
Equipment Specification Sheets	ESS	All equipment specifications

Document Types	Acronym	Application / Use
HAZOP	HOP	For Hazard and Operability analysis, report & procedures.
HSE Plans	HSE	For Health, Safety & Environment plans
Inspection & Test Procedures	ITP	For plant wide Inspection & Test Procedures
Inspection & Test Report	ITR	For plant wide Inspection & Test reports
Material/Equipments Status Report	MES	For documents on materials/equipments received from the vendor
Manuals	MAN	All types of manuals
Organisation Charts	ORG	For Organisation charts of all participating organisations of the project
Photographs, Images & Videos	PIV	For all plant wide photos, videos and images
Planning Report	PLR	For documents relating to planning in terms of disciplines and activities plant wide
Progress Report	PRE	For project progress report on daily, weekly, fortnightly and monthly basis
Project Quality Plan	PQP	For al the quality plans for project
Project Schedules	PSC	For project schedules up to level 3
Quality Control Report	QCR	For documents pertaining to quality during the construction stage
Risk Assessment	RAS	For documents relating to risk identification reports
Risk Management	RMA	For risk mitigation/ management
Safety Reports	SRE	For all safety related reports

4.7 Document Status

Status	Use / Explanation
Approved	The document is approved as submitted
Approved subject to comments	Documents approved with some comments
As Built	As built documents
Cancelled	Documents that have been cancelled or are no longer relevant
Draft	Draft documents
Final	Final documents
For co-ordination	Coordination related documentation
Issued for Approval	Documents issued for approval
Issued for Construction	Documents approved to be used for construction
Issued for Information	Documents issued for information. Must not be used for construction
Issued for Tender	Documents of various disciplines/packages which are issued for tender
Issued for Comments	Documents sent to consultants for their advice
Preliminary	Documents in progress (Not for construction)
Rejected	Documents that have been reviewed and rejected

4.8 Document Formats

It is important to use agreed file formats for distribution among project members. The following file formats could be used for each document type.

Typically the file format for all registered documents will be: **Adobe Acrobat PDF Format.** Other native or original formats can be utilised if a "*Live*" document needs to be exchanged. Files attached to **MAILS** will use the file format applicable as .jpg, .tif, .xls, .ppt etc.

Document Type	Use	Formats Required
Contracts		PDF, ZIP
Drawing		PDF, DWG, TIFF, DGN, (PDS files),NWD,NWF
Meeting Minutes		DOC, PDF, XLS
Reports		DOC, PDF, XLS
Schedule		MPP,PDF, XER
Photographs		JPEG, TIFF

4.9 Document Numbering

All participants MUST follow a unique numbering system for the documents. This ensures easy retrieval at a later date. They must also utilise the "*Naming Acronym*" to ensure that primary searches/filters for documents can be done effectively.

No characters that are not permitted by Microsoft Operating System (MS DOS based) to be allowed in the file numbering or naming in hardcopy format. This reduces time taken in registering and superseding the documents on Aconex.

It is suggested that this be used by all team members. Rule for Native CADD Documentation, Aconex will not allow the same document number to occur twice within a project. So, to allow the exchange of both PDF and CADD data of the same file, the following document registration coding could be employed.

Example of Computer file name	Example of Registered Number on Aconex
A001-ALI-DWG-0001-JP-CAD_B.dwg	A001-ALI-DWG-0001-JP-CAD Rev B
A001-ALI-DWG-0001-JP-PDF_B.pdf	A001-ALI-DWG-0001-JP-PDF Rev B

4.10 Project Mail (Correspondence)

Some Of The Unique Features Of Aconex Mail Are:

- Covers all correspondence exchanged via the Aconex service
- Project Mail is automatically tagged and numbered for easy retrieval
- Any attachments to project mail will be stored on the system but searchable via locating the project mail

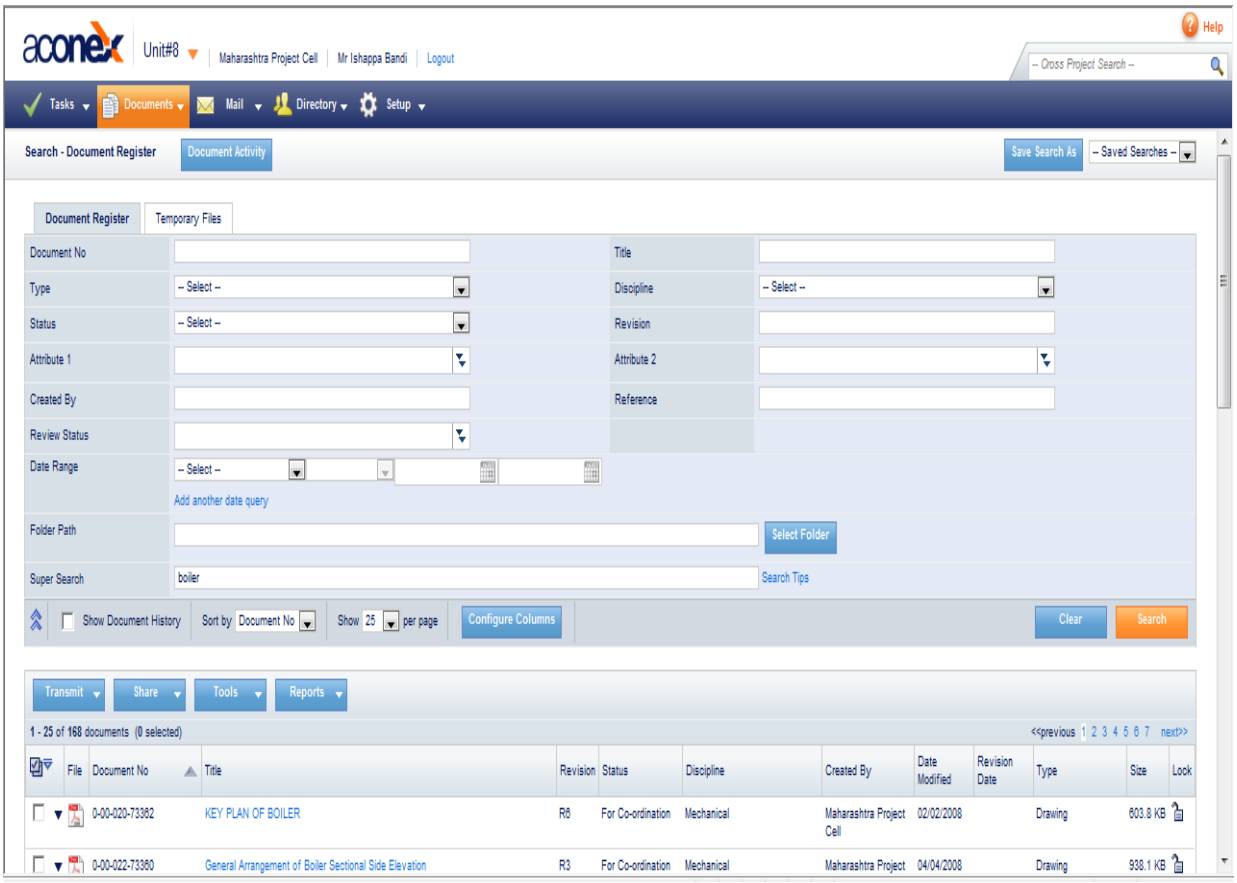
All project related correspondence and mails are to be sent via the Aconex system. Certain project mails like planning of social activities or confirming the attendance at a meeting need not be on Aconex.

5. Conclusion

The importance of the Project Information Management System is highest because a wrong drawing or any other document with absolute revision may cause the lot of damage to the project. Also the non availability of documents with the site engineer may lead to delay in the project and its effects on the cost of the project. Communications are a critical deliverable of every successful project and a key project management soft skill.

The Power Generation project should be intended to exploit the environmentally friendly, renewable, hydroelectric energy. In the present day, the engineering focus is on conducting the pre feasibility studies and preparing the project Information System.

Project communication is one deliverable that one may be personally responsible for and it's one that has a large influence over your project's success or failure. It is important to know that what project information? to be communicated to a stakeholder group and it is inextricably tied to the information that is available for the communication? After all, you can't communicate what you don't know. On the other hand, if the need for the information is real and gathering the information is feasible, one should make every effort to make it available. The



A snap shot of the ACONEX;

choice of the information to be communicated cannot be made without considering the project's tools and techniques for gathering the information and vice versa.

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