

THE COMPUTERWORLD HONORS PROGRAM

CASE STUDY



LOCATION:
*West Sacramento, California,
United States*

YEAR:
2006

STATUS:
Laureate

CATEGORY:
*Environment, Energy and
Agriculture*

NOMINATING COMPANY:
Adobe Systems

ORGANIZATION:

Bureau Veritas/Berryman & Henigar

PROJECT NAME:

Palomar Energy Project

Summary

At Bureau Veritas (BV), we work closely and efficiently with several organizations to approve thousands of building permits for the Palomar Energy Project's electrical, civil, mechanical, plumbing and structural systems to get Palomar power plant up and running for the San Diego Gas & Electric (SDG&E) customers. We have selected Adobe Acrobat Professional software and Adobe Portable Document Format (PDF) as the solution to improve collaboration across project teams by enabling members to electronically exchange, mark up, and sign engineering drawings in PDF. Instead of receiving stacks of paper, we receive e-mails when plans in PDF are posted to our extranet. Reviewers can comment electronically using engineering mark-up tools in Acrobat such as redlining, clouding, and notes. All feedback is merged into a single file and the submitting engineer is notified by e-mail that the edited plan is available. Digital signatures are used to approve documents to create legally binding plans ready for archiving. The result is improved team relationships, reduced cost and streamlined processes all around.

Introductory Overview

The power shortages experienced throughout California in 2000 were unprecedented in the scope of their coverage and duration. Since then, government organizations and private industries have been working together to prevent future power shortages from disrupting the lives – and livelihoods of Californians.

Situated on 20 acres in an industrial park north of San Diego, the Palomar Energy Project is a state-of-the art facility using natural gas to generate more than 546 megawatts of electricity, enough to power approximately 550,000 homes receiving services from San Diego Gas & Electric (SDG&E). This energy generating and environmental system consists of an impressive two combustion-turbine generators, two heat recovery steam generators, a steam-turbine generator and hundreds of other critical systems.

BV was selected as the consulting firm acting on behalf of the State of California and the California Energy Commission (CEC) to approve thousands of building permits for Palomar's electrical, civil, mechanical, plumbing and structural systems. The lead manager of our team, Kevin



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Wedman, as Chief Building Official (CBO) understands that this large project is on an ambitious schedule and that our goal is to quickly and reliably permit the project to have Palomar up and running for the SDG&E customers as soon as possible.

Besides BV, SDG&E, and the project's engineering and construction firms - Bibb & Associates, Inc. and Kiewit Industrial Co., respectively face one of the main challenges in managing the huge volume of engineering plans. Both Bibb & Associates, Inc. and SDG&E deliver design plans to BV for approval. Once approved, plans have to be sent to Kiewit Industrial Co. to be used during construction. Time is of utmost importance to avoid project delays; we need to efficiently track, review, and manage engineering plans.

BEFORE EDSA:

Too many documents, too many formats

Previously, when engineers at Bibb & Associates, Inc. or SDG&E worked on a large project, they would have to plot, collate and deliver thousands of pages of design plans to BV for permit approval. The engineer designing the plan also had to sign them before multiple copies of the plan were produced and sent for review. As a result, costs and delays could mount as plans were returned to engineers for changes because they did not comply with code requirements. Often times, a project has to go through five rounds of review cycles with engineers before becoming code-compliant. When plans were approved, BV staff would sign and date the materials and send them back to Bibb & Associates, Inc. or SDG&E. The originating firm would then forward the approved plans to Kiewit Industrial Co. to use during construction of the project. Not only does this process cost hundreds of thousands of dollars for a large project such as Palomar, but project delays due to lost documents, confusion over which documents are approved, or waiting for mailed documents to arrive can create additional headaches. Also, California regulations require that final plan document be converted from paper to an electronic format for archiving. This means that for each project, BV has to scan thousands of approved engineering plans to generate TIFF files for storage on disk. Scanning documents takes weeks of work and the TIFF documents are of little value since they are not searchable documents.

The EDSA SOLUTION:

Minimizing project costs and delays, secure, easy-to-manage Adobe PDF Files

By adopting Adobe Acrobat Professional and Adobe PDF, BV is bringing new efficiencies to the engineering and design industry. CAD drawings created in AutoCAD or Bentley software, project plans and other supporting documents can be converted to platform-and-application-independent Adobe PDF files. The compact Adobe PDF files are much smaller than CAD files in native applications, making them faster to download and requiring less storage space. At the same time, design details are clearer due to the function in Acrobat software that allows zooming in and out when viewing the plans.

"We can more efficiently manage documents in Adobe PDF than as paper blueprints," says Alan Colton, electric project manager at SDG&E, who is designing the connector valves to deliver natural gas from SDG&E lines to Palomar generators. SDG&E is also developing the electrical transmission lines interconnecting with Palomar generators to deliver power to the company's service territory. "Tracking reviews and verifying who has approved content is also streamlined because engineers can digitally sign Adobe PDF files using the Self Sign feature in Acrobat or digital signature solutions from companies like VeriSign."



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Review materials in hours, not weeks

Instead of receiving stacks of engineering drawings on paper, BV staff now receives emails alerting them when plans in Adobe PDF are posted to the company's extranet. Reviewers can download the plans and comment electronically using engineering mark-up tools in Acrobat Professional software such as redlining, clouding and notes. After reviewers have commented on the Adobe PDF file, all feedback is merged into a single file associated with the plan. The submitting engineer is then notified by email that the edited plan is available from BV.

This dramatic improvement allows BV to review materials up to 95% faster – in hours instead of days or weeks. Subsequently, engineers receive feedback that is easier to read and implement. For approved documents, BV reviewers add digital signatures using Acrobat Self Sign, enabling the firm to instantly create a legally binding plan, ready for archiving.

Vital control over document processes

When all plans – structural, plumbing, civil, mechanical and electrical are approved and permitted by BV, the multiple Adobe PDF files are combined into one file. We can place plan information in any file format and combine it into a single, indexed file. With this process, documents are easier to manage and finding information is faster because files can be searched electronically. If a question arises about a plan, staff can find the details in seconds instead of hours spent searching through paper archives or a disk full of TIFF files.

Digitally signed Adobe PDF files offer the added benefit of aiding document control because if content is changed after a file is signed, the electronic signature is invalidated. Even slight plan modifications made after approval could have disastrous effects; such as possibly weakening the structure and resulting in the need to rebuild sections. It is crucial to protect the content of the approved plans. By digitally signing Adobe PDF files, we can reliably monitor any unapproved changes made to the engineering plans.

Looking ahead

With the success of using the EDSA program on the Palomar Project, BV is requiring EDSA for design review and approval on future projects. With this program, we can and have reduced document management costs for large projects, such as the Palomar project by more than \$100,000, while at the same time, free up more time and resources to ensure that building projects always meet the highest safety standards.

Benefits

San Diego Gas & Electric.

The client benefits from reduced costs to manage Palomar engineering documents by more than \$100,000 and accelerated plan review cycles by 95%.

Engineers and Construction Firms.

By adopting Adobe Acrobat Professional and Adobe PDF, BV is bringing new efficiencies to the engineering and design industry. By establishing procedures for reviewing, revising and digitally approving plans in Adobe PDF, the project's administrative process have been streamlined.

BV Staff.



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Compact Adobe PDF files are faster to download and require less storage space. At the same time, design details are clearer due to the function in Acrobat software that allows zooming in and out when viewing the plans. Reviewers can comment electronically using engineering mark-up tools in Acrobat Professional software such as redlining, clouding and notes.

Management.

As a single, indexed file, documents are easier to manage and finding information is faster because files can be searched electronically. By digitally signing Adobe PDF files, we can reliably monitor any unapproved changes made to the engineering plans.

The Importance of Technology

The Adobe Acrobat Professional software and Adobe Portable Document Format (PDF) are selected to streamline the management of documents:

- *Inexpensive, off the shelf solution (Acrobat 6.0 Pro®)
- *Multiple file formats printable to PDF
- *All PDF documents readable with free Adobe Reader
- *“Intelligent” data recordation
- *Means for secure digital signature validation and recordation
- *Good “Chain of Custody” accountability - all actions time and date stamped
- *State government moving towards PDF standard

To further expedite the digital workflow, BV developed the following operational protocol for submittal tracking and processing:

- *Use FTP/BV NET site as primary means for transmitting and receiving documents
- *E-mail notification of postings
- *Version control methodology

Staff and client training:

- *Digital commenting
- *Digital stamping / signing
- *File sharing protocols

Originality

EDSA is a first of its kind program, developed after many separate project difficulties of the paper workflow environment that is now done entirely electronic. By selecting the Adobe Acrobat Professional software and Adobe Portable Document Format, EDSA provided a foundation for electronically managing design and construction plans.



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Success

EDSA has achieved its original goal of adopting a standard, electronic format for handling engineering documents, establishing controls over approved documents to prevent changes and eliminate costly and time consuming paper-based review cycles.

Quotes:

Alan Colton, SDG&E Electrical Project Manager: "We can more efficiently manage documents in Adobe PDF than as paper blueprints. Tracking reviews and verifying who has approved content is also streamlined because engineers can digitally sign Adobe PDF files using the Self Sign feature in Acrobat."

Kelly Zullig, CBO Coordinator, Bibb & Associates, Inc.: "By digitally signing Adobe PDF files, we can reliably monitor if any unapproved changes were made to engineering plans."

Awards & Merits

*Merit Award in CELSOC's 2006 Engineering Excellence Award Competition

*Heralded as Adobe's Success Story of the Year

*Distinguished Project Award in 2006 WCCC Advanced Technology Award Competition

Difficulty

Our main difficulty is to educate people in the transformation of working with paper into electronic files.