

Video Streaming and Archiving Tools for use in Knowledge Preservation, Internal Communication, and Internet Access

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**Video Services Department, 3653
Sandia National Laboratories**

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company,
for the United States Department of Energy's National Nuclear Security Administration
under contract DE-AC04-94AL85000.



Sandia Laboratories Core Purpose

Securing a Peaceful and Free World through Technology

Nuclear Weapons



***Safe, Secure,
Reliable Weapons***



Defense Systems and Assessments



Detection



***Remote Sensing
and Verification***

***Integrated
Military
Systems***



Energy, Resources, & Nonproliferation



Energy



Safety and Security



Critical Resources



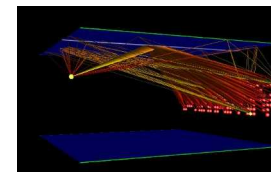
Efficiency

Homeland Security and Defense



Chem-Bio Defense

Cyber Protection



***Explosives
Countermeasures***



**Sandia
National
Laboratories**

Sandia's Weapons Engineering Professional Development Program

Our Goal:
Build a curriculum of Nuclear Weapons Professional Development courses and high value training products that provide continuous learning opportunities for Sandians.

The screenshot shows the homepage of the Weapons Engineering Professional Development (WEPD) Department 2916 website. The header features the title 'WEAPONS ENGINEERING PROFESSIONAL DEVELOPMENT' and 'DEPARTMENT 2916' with four circular icons representing different engineering fields. On the right, a photo of Stanley Kawka, WEPD Manager, is shown with his contact information: 'STANLEY KAWKA, DEPARTMENT 2916, WEPD MANAGER, 505) 844-0971'. Below the header, a navigation bar includes links for 'Our Team', '2000 ILMS', and 'Contact Us'. The main content area has a large banner for 'Weapons Engineering Professional Development (WEPD)' with a quote: 'Providing professional development forums, capabilities, educational programs, and products to enhance intellectual and skills based knowledge of Sandia's technical workforce'. Below the banner are several small circular icons and a row of buttons labeled 'TS', 'WIP', 'NST', 'NES', 'NQT', 'SE', 'W76-1', 'KM-SAL', and 'SR'. At the bottom, there are three tabs: 'Our Mission', 'What We Do', and 'How May We Assist You?'. The 'Our Mission' tab is selected, showing a paragraph about the WEPD Department 2916's role in managing, administering, and coordinating activities for the Nuclear Weapons Community.

**Engaging the learner
through the
use of electronic media**



Types of Training and Professional Development

STRATEGIC

Strategic Alignment

- Provide Direction and Leadership
- Strategic Education Committee
- Product Lifecycle Management

Knowledge Management

- Disseminate Historical Information, Lessons Learned & Better Practices
- Systems Engineering Case Studies
- Systems Engineering Colloquia and Technical Symposia
- KM Capabilities

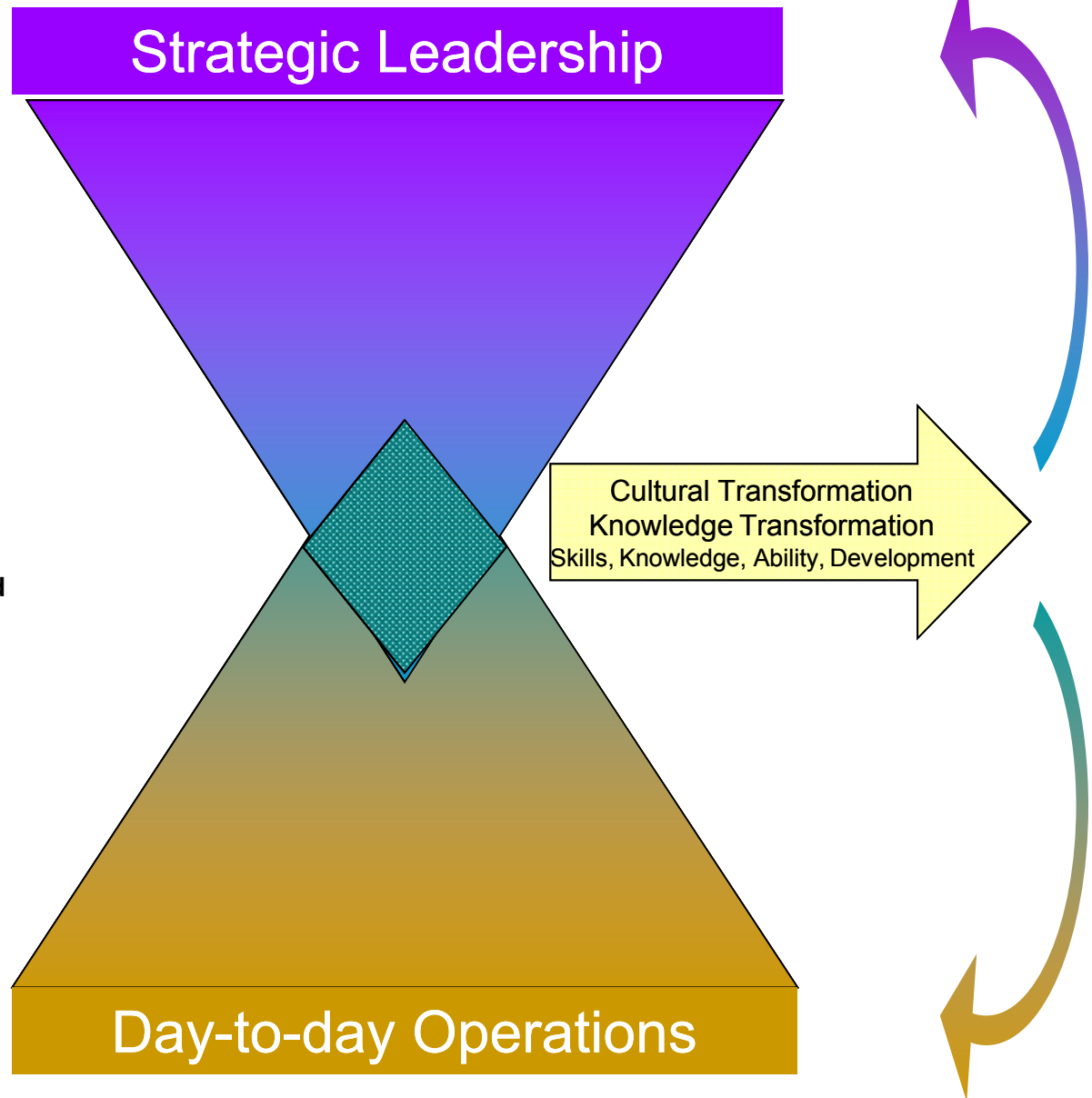
Professional Development

- Improve Technical Expertise and Build Credibility
- University Programs
- Strategic Educational Initiative
- Professional Memberships

Skill and Task Training

- Teach Technical Staff Members Basic Sandia Concepts, Processes & Procedures
- Engineering Applications Education
- Weapons Education
- Line-specific Training

TACTICAL



The Knowledge Management Streaming Assets Library

“Fully Integrated” Knowledge Presentation Video Streaming Capability!

Utilizes NTK Kerberos
Authentication
Controlled Access to
Information Based
on Owner's Needs

Presentation
Table of Contents

PowerPoint Presentations
Synchronized with the
Video as it is delivered

Topics:
An Ethical Imperative
Modern Product Qualification
Achieving Excellence

Classification: **Unclassified**

Table of Contents

**Achieving Excellence in
Engineered Products and
Processes John H. Stichman**
Topics: An Ethical Imperative
Modern Product Qualification
Achieving Excellence

Highlights Searchable Text
Results using Transcripts,
Slide Content and description

Description

Transcript

Slide Content

Video Metadata

Help

Search slides for **Profession**

Search

◀ ▶

and Ethics is a Defining Element of Professions:

Systematic body of theory Professional authority Knowledge-
ent judgement and discretion Connection of community Code of
d values Nurturing

Media Site

andia
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Present Knowledge-Base is Future Knowledge Preservation

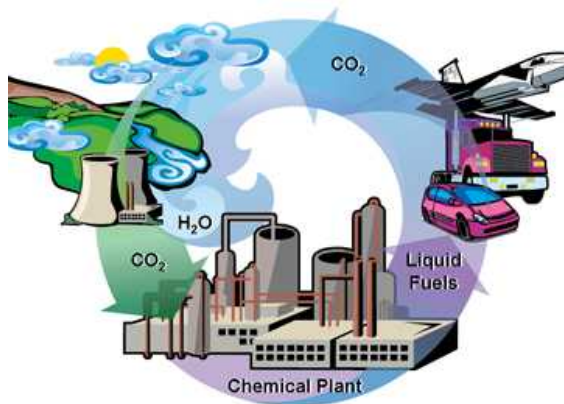
Preserve Historical Information



Videotaping and Capture of Training



Expand Current Intellectual Knowledge



On-Line Delivery



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What To Capture?

The Decision Making Process

- ▶ **Identify knowledge about current and historical events that are relevant today and in the future**
 - **Use forums to make the information available**
 - **Build Communities of Practice**
- ▶ **Identify what knowledge is at risk – then take action**
 - **Get management to own and actively engage in the process**
 - **Actions include: employee professional development, training, skills retention**
- ▶ **Develop knowledge transfer practices**
 - **Ensure the developed product will be used by the follow-on technical team**

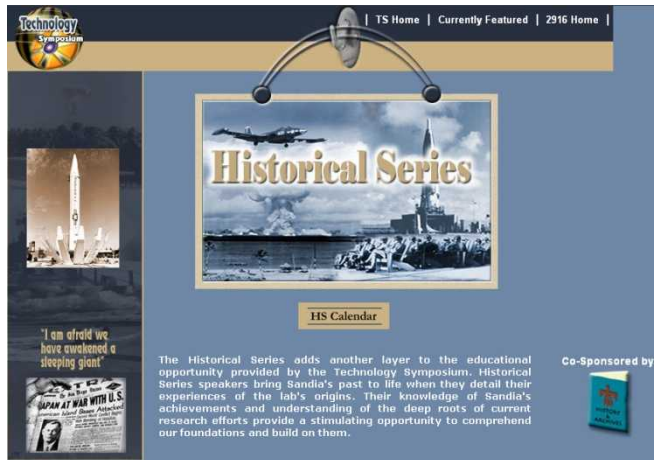


Technology Symposium Series

Capturing Technical Expertise

Methods / Tools

Example: Technology Symposium lecture series, Mark Boslough, 2009



Series Goals:


- ▶ Provide forum for Sandians to engage in learning opportunities and knowledge sharing both inside and outside their areas of expertise.
- ▶ Promote networking opportunities and Point of Contact information.
- ▶ Address current trends of technological significance, approaches to innovation, and technology applications.
- ▶ Build communities of practice.



Media Site

Sandia Streaming Video

Explore **Sandia National Laboratories**: the people, the place, the research and the exceptional service in the national interest. Sandia's video collection depicts how the work performed by our people impacts local, national, and global communities. Browse and select videos by category to view them in the embeddable player.



Focus on Sandia at 60

The Lockheed Martin monthly video news brief focused on Sandia National Labs providing 60 years of service in the national interest for their October 2009 issue.

Duration: 00:05:13

[Play Video](#) | [Full Screen View](#)

Video Categories

At Sandia

[See All](#)



Mission Execution

Community Service

[See All](#)



Building a Better Future Together
(State of the Labs 2008 Opening Video)

Energy

[See All](#)



Solar Nate

Recruiting

[See All](#)



Work/Life Balance

Media B-Roll

[See All](#)



Rhythm and Booms

National Security

[See All](#)



Homeland Security and Defense
Force Protection

Science/Engineering

[See All](#)



Plasma Flame Thermal Spray

Featured Video



Focus on Sandia at 60

<http://www.sandia.gov/video/>



Streaming Video History at Sandia

2002

- Streaming first deployed at Sandia.
- Used a limited number of subnets in NM for research and proof of concept to test impact on computing infrastructure.
- Used Microsoft Windows media encoder/media server and was unicast only.

2003/2004

- Streaming had its advocates and its nay-sayers but tests were successful.
- CA was brought on line and all subnets were included.
- Looked at using other encode & delivery platforms including Virage, an Mpeg-4 solution.
- In 2004 adopted an Mpeg-4 solution called Envivio

2004/2005

- Customers liked the Mpeg-4 solution which provided live dual-screen streams (video & graphics) but the maintenance overhead and constant compatibility issues became untenable.
- In mid-2005 dropped Envivio and returned to using a straight Windows Media solution.
- End of 2005 we began looking for something that would fit our growing list of requirements; live streaming, multicast capable, included video and graphics, good content management

2005/2006

- Sonic Foundry sold all of its music & editing software business to Sony and introduced Mediasite.
- We bought a test unit, adopted and implemented Mediasite lab-wide as our streaming solution.
- In 2006 we did an ROI study with Forrester Research on streaming delivery. The results showed a positive ROI of almost 4:1

2007/2008

- Getting the word out and building a client base. Putting in lots of hard work

2009

- Pushed SilverLight thru the ADP process so it could officially be integrated into the Sandia COE as vetted and supported software.



Video Streaming and Media Site 2010

- In 2010 Video Services delivered a live stream to our largest on-line audience to date, and the usage increased by 30% over 2009
- Delivered streams to over 10,000 unique users at their desktops
 - A majority of the Sandia workforce has benefited from this service.
- Videotaped over 350 live events, plus additional programs.
- Our 10,000+ unique users viewed over 25,000 hours of programming using both on-demand and live streaming services
- 1569 different presentations from our archives were viewed.



Media Site

The screenshot shows a web browser window titled "Sandia National Laboratories Public Streaming Archive - Windows Internet Explorer". The address bar displays the URL: <http://mediasiteson.sandia.gov/mediasite/Catalog/pages/catalog.aspx?catalogId=7402e84d-48e4-467e-813c-0ecd42ca3d08&folderId=>. The browser's Favorites bar includes links to "CCHD", "CSU Information", "SEEMS Web Mail", "SNL Directory", "SNL Index", and "Google".

The website header features a banner with "SNL events" and "Video Streaming" text, along with logos for various video services. Below the banner, the page title is "Sandia National Laboratories Public Streaming Archive" with a "Welcome Guest" and "Login" link.

The left sidebar contains a tree view of the site's structure:

- Sandia National Laboratories Public Streaming Archive
 - At Sandia
 - Community Service
 - Energy
 - Health
 - Historical Material
 - Media B-Roll
 - National Security
 - Sciences & Engineering
 - Technical Training

The main content area is titled "Sciences & Engineering" and includes a search bar and a list of video presentations. The list shows the following items:

- Pellitron Accelerator**
 - Org 3653 SNL Video Services
 - On Demand
 - Friday, October 29, 2010, 2:08 PM MDT
 - 4 Minutes 18 Seconds
- Ion Beam Laboratory Dedication**
 - Org 3653 SNL Video Services
 - On Demand
 - Friday, October 29, 2010, 2:06 PM MDT
 - 9 Minutes 14 Seconds
- Mapping Ionic Currents and Electrochemical Reactivity on the Nanoscale: Electrochemical Strain Microscopy of Li-Ion and Oxygen-Ion Conductors**
 - Org 3653 SNL Video Services
 - On Demand
 - Tuesday, October 19, 2010, 9:00 AM MDT
 - 1 Hour 9 Minutes 59 Seconds
- UMBRA**
 - Org 3653 SNL Video Services
 - On Demand
 - Tuesday, August 31, 2010, 12:05 PM MDT
 - 4 Minutes 23 Seconds
- Plasma Flame Spray Thermal Spray**
 - Org 3653 SNL Video Services
 - On Demand
 - Friday, August 06, 2010, 2:54 PM MDT
 - 1 Minute 58 Seconds
- Moving the Tandem Van De Graaff Accelerator (long Version)**
 - Org 3653 SNL Video Services
 - On Demand
 - Tuesday, August 03, 2010, 12:41 PM MDT
 - 19 Minutes 38 Seconds
- Moving the Tandem**
 - Org 3653 SNL Video Services
 - On Demand

The bottom of the page shows the "Mediasite Catalog version 5.3.0" and a status bar indicating "Local intranet | Protected Mode: Off".

<http://www.sandia.gov/video/>



Media Site

Report Summary

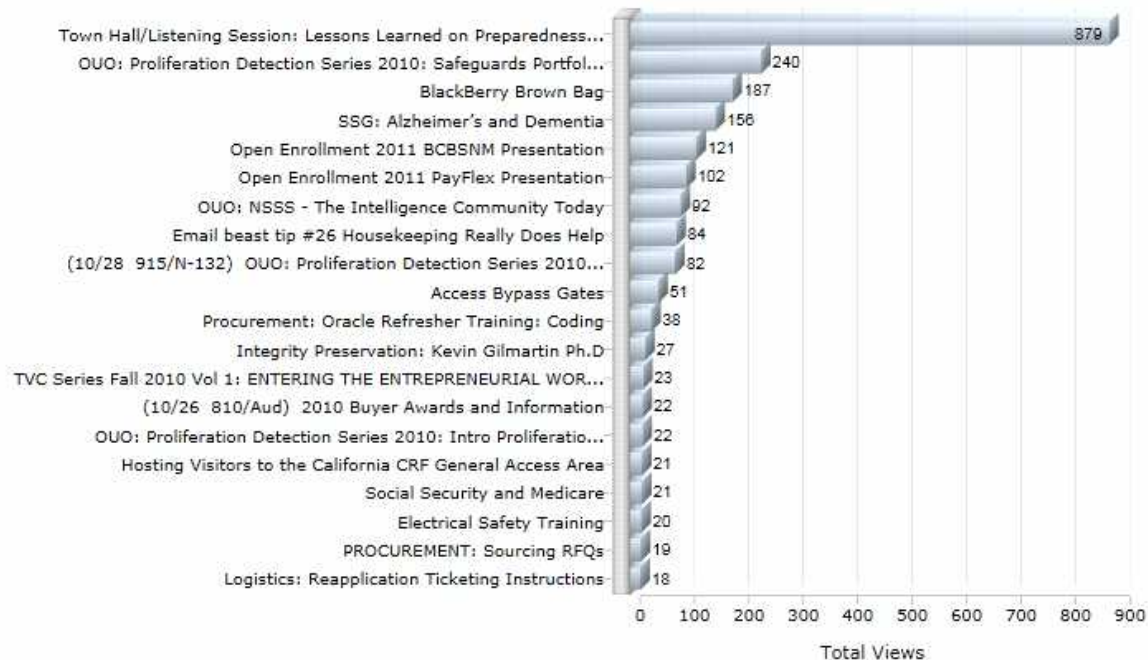
[Print](#) | [Export](#)**Name:** Weekly Presentation Statistics**Presentations Watched** 501 of 2380
Total Views 3397
Total Time Watched (h:mm:ss) 1084:23:20**Date Range:** Custom dates ▾**Start Date** **End Date**

10/15/2010 10/29/2010

► **Include:**

Last refreshed 10/29/2010 10:15 AM CDT

Total Views / Presentation

[Style](#) [View](#)

Media Site

Report Summary

[Print](#) | [Export](#)Name:

Unique Presentations Unique Users Total Views Peak Connections

501 of 2380 1745 3399 61

Date Range:

Start Date

End Date

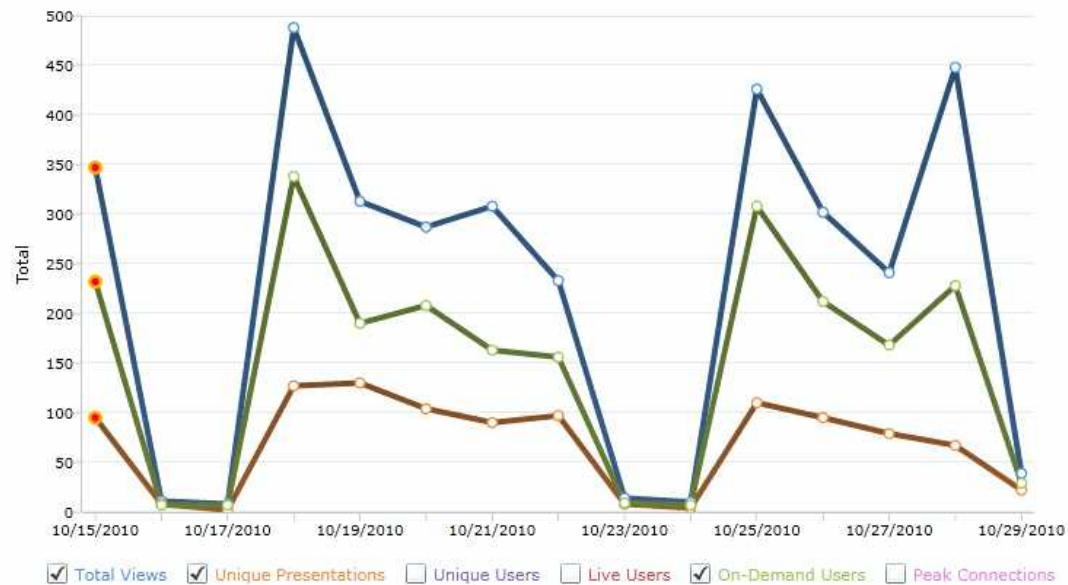
► Include:

Last refreshed 10/29/2010 10:19 AM CDT

Date Activity

[Browser Statistics](#)[Platform Statistics](#)[Player Statistics](#)

Server Activity / Date

View  

Systems Engineering Case Studies Project

Professional Development – Just in Time Learning Applications

The screenshot displays a web interface for the W76-1 Case Study. At the top, there is a navigation bar with links: Home, Case Studies, Vision, Videos, and Contact Us. Below this is a banner for 'SYSTEMS ENGINEERING Resources'. A secondary navigation bar includes links for Role, Topics, Best Practices, Lessons Learned, Conclusion, References, and Other W76-1 Modules, along with 'Dept. 2916'. A red arrow points to a message: 'Please Choose a Module from this Menu'. The main content area is titled 'Technical Project Management' and features a video player showing a portrait of Brian White, Project Integrator. Below the video is a 'Play All' button. To the right of the video, there is text describing the process of Technical Project Management.

W76-1 Case Study

Home Case Studies Vision Videos Contact Us

SYSTEMS ENGINEERING Resources

Role Topics Best Practices Lessons Learned Conclusion References Other W76-1 Modules Dept. 2916

Please Choose a Module from this Menu

Technical Project Management

Technical Project Management is the process used to deliver a product that meets customer performance requirements within cost and schedule constraints. Critical reviews, status reports, and Nuclear Weapons Complex integration are also included in the process cycle.

Technical Project Management is critical to ensuring success from a programmatic perspective. There are many trade-offs and issues that require the team to diligently monitor project interfaces and parameters and take corrective action. Communication is at the heart of technical management.

Brian White, Project Integrator

Play All

Technical Project Management

Brian White,
Systems Engineer
Sandia National
Laboratories

What does the case study story impact:

(Execution, Reliability, Safety, Design, Manufacturing Process, Performance, Operability, Qualifying, Reusability, Other)

- 1) **Create loosely crafted segments (Frame question in terms of defining events...how did you cultivate partnerships?, why did you make the decisions you did?, what worked?, what didn't work?)**



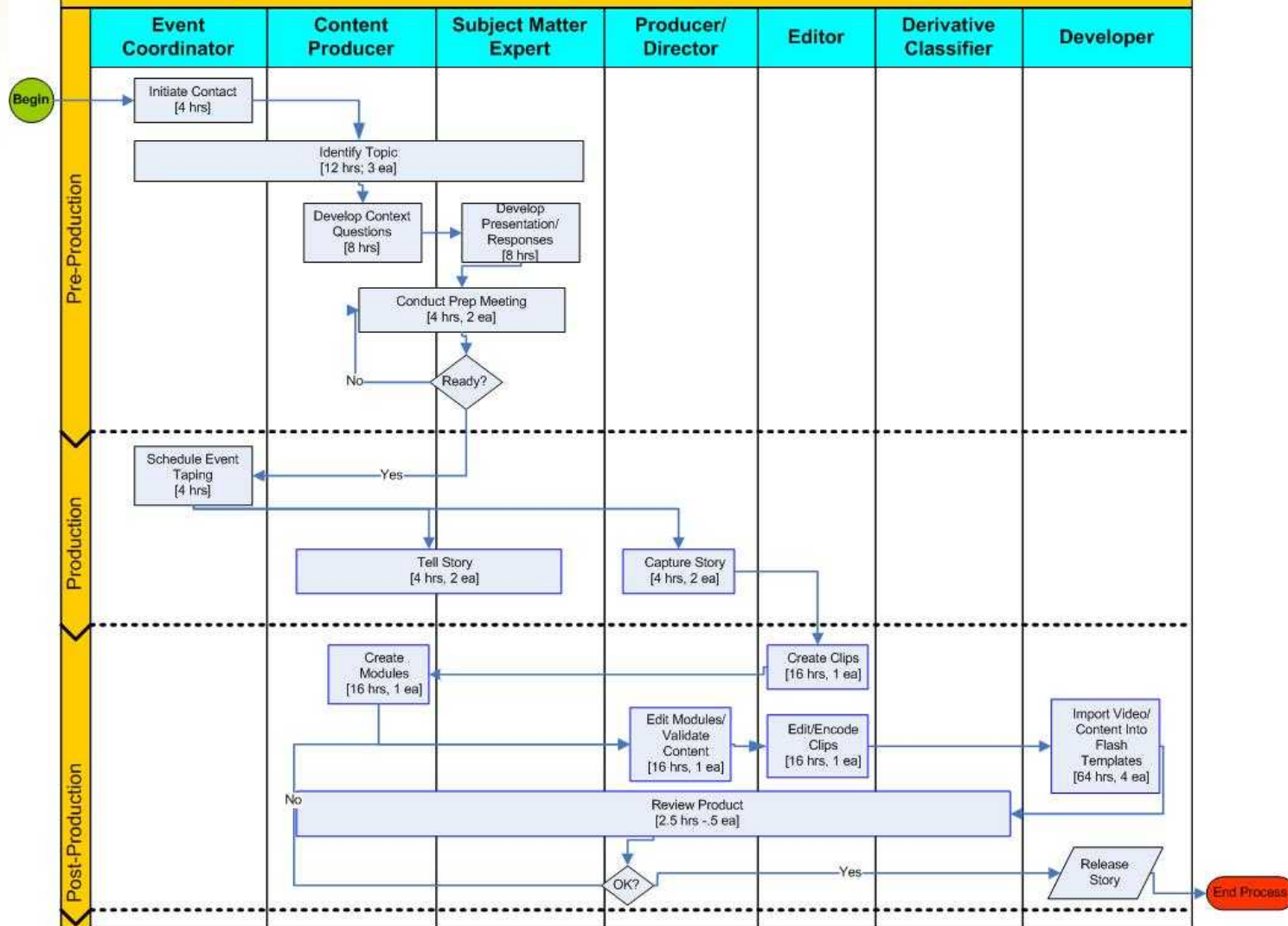
Elements of Video Case Studies

- **Develop “case studies” to socialize the philosophy of subject matter**
- **Include best practices which embody philosophies of intended subject area**
- **Include lessons learned which support the value of subject area**
 - **Relevant History of Case:**
 - Why was this project begun?
 - Background Information
 - What were you asked to do?
 - **Project Overview:**
 - Relevant Requirements, Funding Issues, etc
 - **The Story:**
 - When did you first notice a problem/need for change?
 - What did you notice?
 - What was causing the problem? What driving this change?
- **Include corrective actions taken that support current and future work philosophies**



Computer Based Training Development Process

CBT Development Process (1 Hour- Long Interview= Approx.16, 3-minute long segments)



Case Study Defined

Sample Questions and Answers

Interview Questions:

1) Question Categories:

a) Role, Topics, Best Practices, Lessons Learned, Conclusion

Segment	Speaker	Interview Subject Categories	Interview Questions/ Main Points	
Technical Project Management	Brian White	Role Topics	<ol style="list-style-type: none">1. Q) What is your name and where do you work?-A) Brian White, Systems Engineer SNL2. Q) What was your role and responsibilities on the LEP project? A) Project Integrator3. Q) How did you go about establishing the scope, WBS and cost estimates for the W76-1?4. Q) What was your role in developing the project/program plan including identifying initial project risks, interfaces, making sure you had the right and available resources for W76-1?5. Q) Were there any established processes in place that you were able to apply?6. Q) What was the process used to gain commitment for to the project/program plan?7. Q) What were some of the challenges and key players in achieving agreement for the project plan?8. Q) Describe your role in monitoring the project against the plan?	



The Interviewing Process /Steps

Think like a News Reporter- “Get the sound bite.”

- Outline primary topics
- Identify major themes / key points
- Identify and engage Subject Matter Experts (SME)
- Conduct phone interviews to:
 - Establish process, needs, and next steps
 - Identify supporting materials
- Walkthrough “Subject Matter” with expert
- Build questions that anticipate the answer you need
- Put together question and possible answer in a “script” format
- Conduct video interviews
 - Coach the SME to be brief and to the point

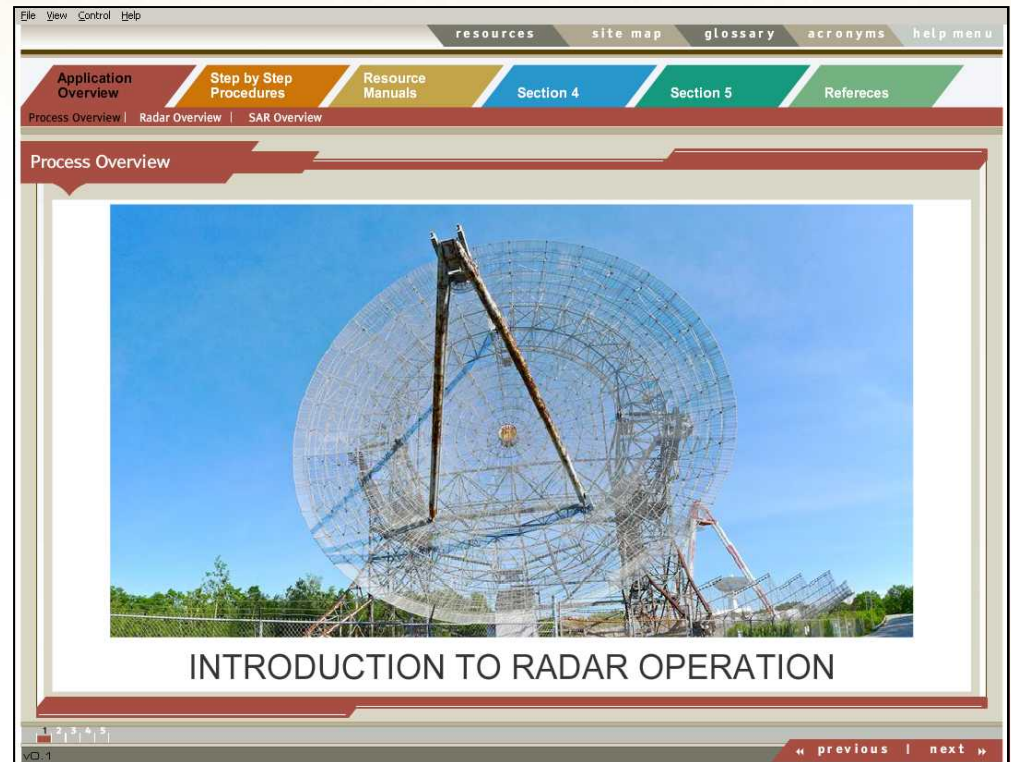


Evolution of Just-in-Time Learning Products

Skills and Task Training

► **Issue: Needed to design a flexible architecture for scalable projects**

- **Answer: Use an Adobe Flash-based framework with flexibility to make front-end changes using XML**



Flash code and basic “container” is now the basis of multiple Computer Based Training (CBT) projects

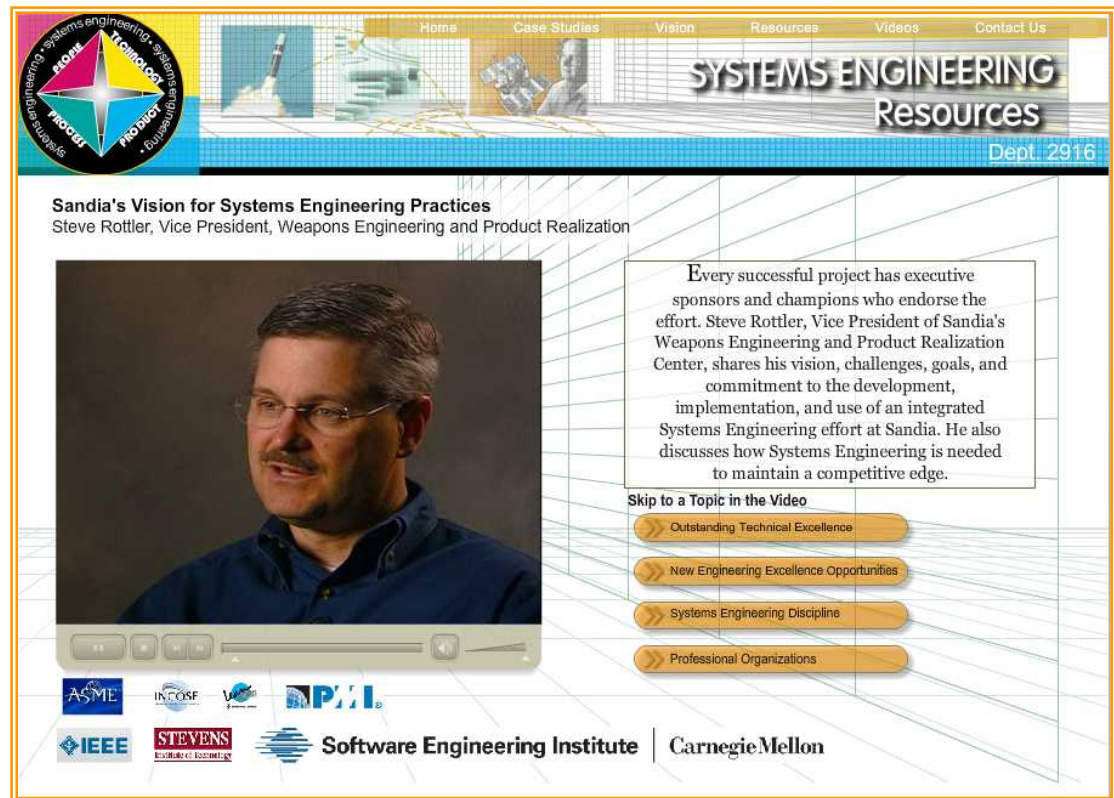


Re-Purposing Media

Methods / Tools

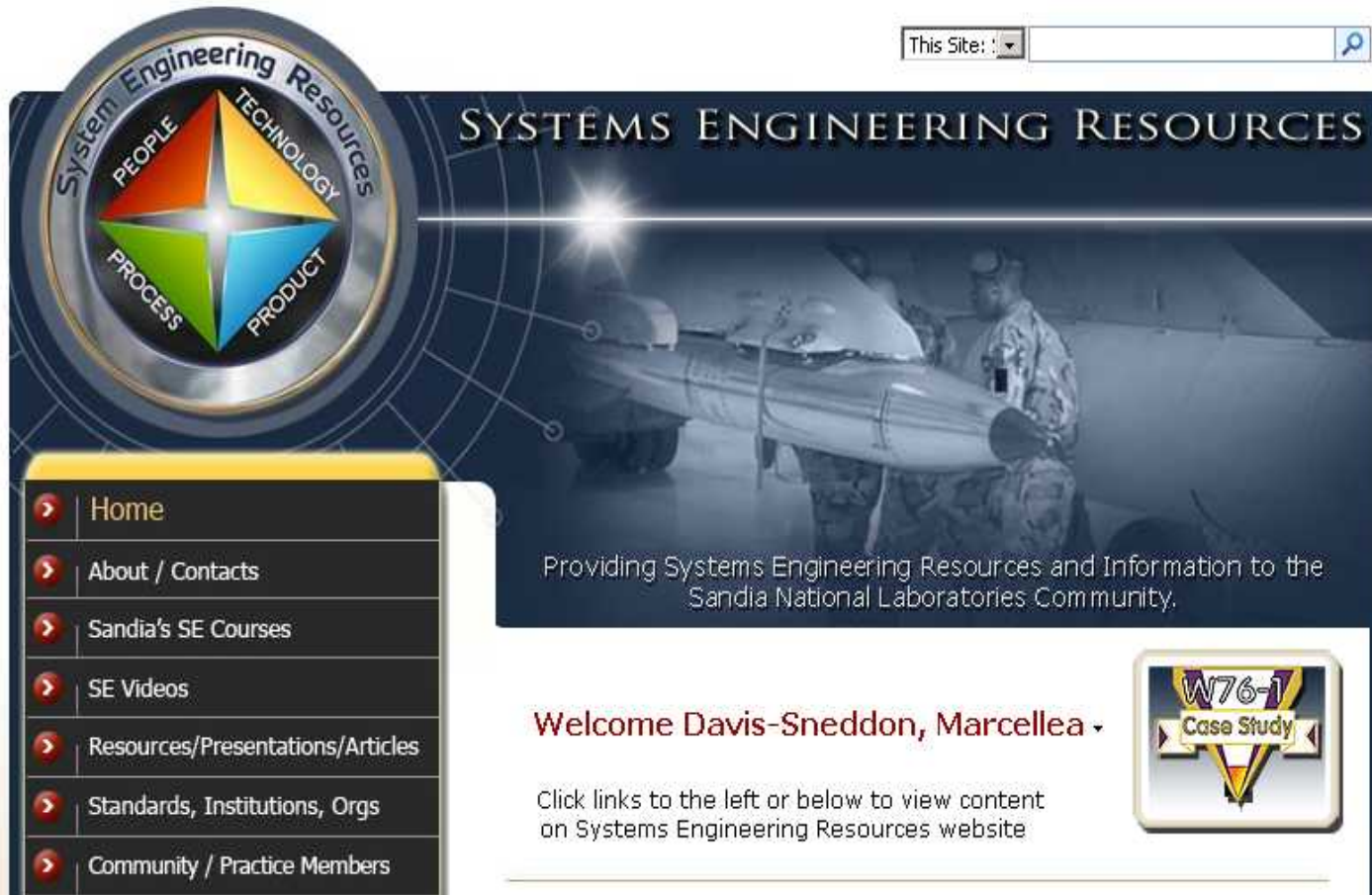
DEMO

- ▶ Used as stand alone Video Promo of System Engineering website- sent electronically to desktops
- ▶ Embedded in an electronic Flyer- Using a PDF format
- ▶ Used in Systems Engineering Training Classes
- ▶ Used to show other VP's and Managers that the project has an Executive Champion who is the Chief of Nuclear Weapons



Evolution of Just-in-Time Learning Products

Skills and Task Training



- ▶ **Building a Community of Practice and Resources Site: The evolution and expansion of an existing Case Study**



Advertising



Welcome to the [Systems Engineering Resources website!](#) Our goal is to provide systems engineering information, training, and social networking resources to the Sandia National Laboratories community.

Community of Practice

The community of practice is a list of personnel from various organizations across Sandia who share a common interest in systems engineering.

[Add your name to the list to connect to others and share news about what's happening with systems engineering at Sandia.](#)



- eFlyers
- Internal News
- Links to Website

Featured Case Study

At the direction of Dr. James G. Roche, the Secretary of the Air Force in 2002, the Air Force Institute of Technology established an Air Force center for systems engineering at its Ohio campus on the Wright-Patterson Air Force base.

[View a collection of Air Force case studies concerning systems engineering.](#)



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Flying Solo- Build a Basic Website

Ideas for the Instructional Designer/ Photographer/ Webmaster/ Archivist –with no staff

Title of Project



[Link to Presentation](#)

[Link to Resources](#)

- Make video into WMV. File and post to web
 - Add link to accompanying presentation
 - Add links to process documents or resources
- Use SharePoint for communication, links

Get creative with finding resources:

- Hire a student to run your camera, build your website, etc..



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Laboratories

Flying Solo- The Tools

Ideas for the Instructional Designer/ Photographer/ Webmaster/ Archivist –with no staff

The basic tools:

- **Digital Video Camera, Microphone, Software program for video editing and for web interface**
 - **Basic video editing program**
 - **Adobe Premiere**
 - **Suggested software programs for building web interfaces**
 - **Captivate**
 - **Smart Builder**



The Knowledge Management System and Streaming Video Tools



Sandia's Knowledge Management Streaming Assets Library

Similar Commercial Off The Shelf (COTS) products:

Autonomy Virage: <http://www.virage.com>



Media Site: <http://www.sonicfoundry.com/>



Conclusion



- Capture subject matter expert discussions that will be important to both present and future generations.
- Develop educational products that can be quickly accessed through on-line technology.
- Give the right information, to the right person, at the right time.
- Use media in multiple applications for optimization of resources.
- Link learning products to corporate-wide network, and use links from external resources.
- Build an on-line Community of Practice