

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

IAEA Consultancy, Nov. 10-12, 2010

**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

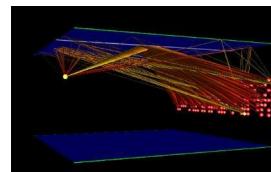


Efficiency

Homeland Security and Defense



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) website. The header features the text "WEAPONS ENGINEERING PROFESSIONAL DEVELOPMENT" and "DEPARTMENT 2916". Below the header are four circular icons representing different professional areas. To the right of the icons is a photo of Stanley Kawka, WEPD Manager, with his contact information: DEPARTMENT 2916, WEPD MANAGER, 505 844-0971. The main content area is titled "Our Team" and "Weapons Engineering Professional Development (WEPD)". A sub-section titled "2000 ILMS" is visible on the right. Below the main title, a quote reads: "Providing professional development forums, capabilities, educational programs, and products to enhance intellectual and skills based knowledge of Sandia's technical workforce". A navigation bar at the bottom includes links for TS, WIP, NST, NES, NQT, SE, W76-1, KM-SAL, and SR. A footer box contains the text: "The Weapon Engineering Professional Development (WEPD) Department 2916 manages, administers, and coordinates a diverse set of activities that provide the members of the Nuclear Weapons Community with opportunities to expand and to certify their weapon knowledge and experience in order to develop and maintain the nations nuclear deterrent."

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

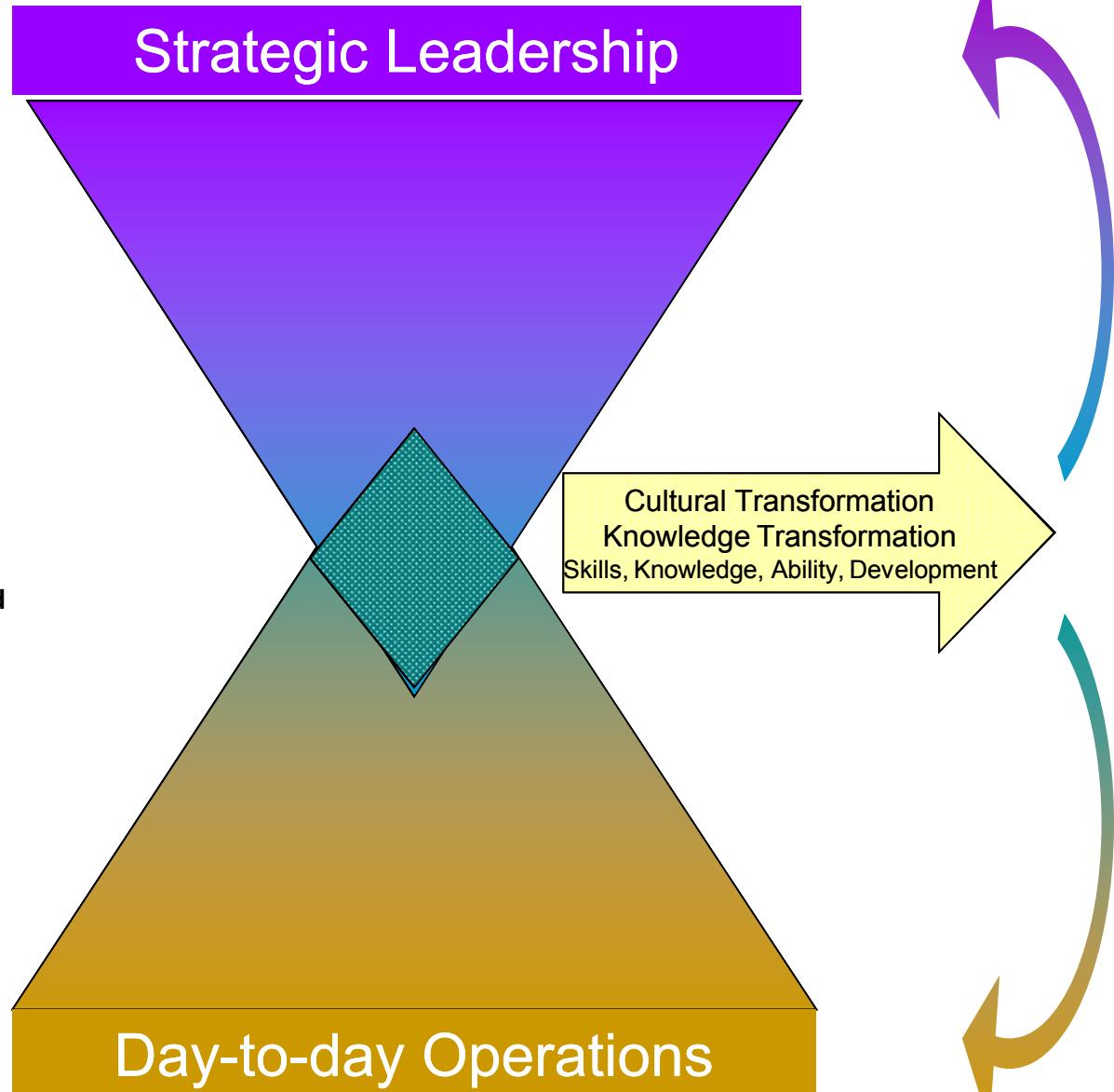
Professional Development

- 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

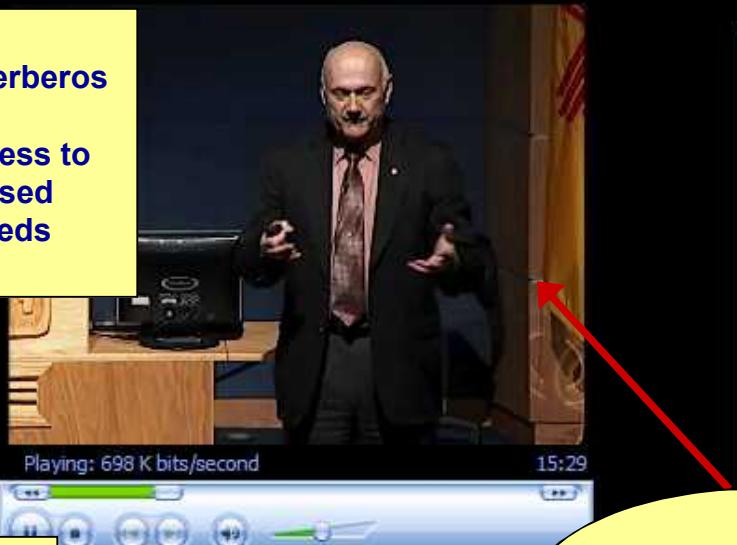
TACTICAL



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

Classification: Unclassified

Table of Contents

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

PowerPoint Presentations Synchronized with the Video as it is delivered

Topics:
An Ethical Imperative
Modern Product Qualification
Achieving Excellence

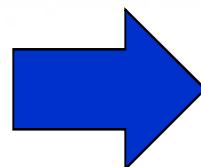
Highlights Searchable Text Results using Transcripts, Slide Content and description

and Ethics is a Defining Element of Professions:
Systematic body of theory, Professional authority Knowledge-judgement and discretion, Sanction of community Code of values Nurturing

Media Site

Present Knowledge-Base is Future Knowledge Preservation

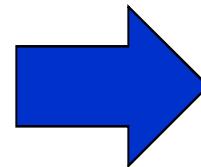
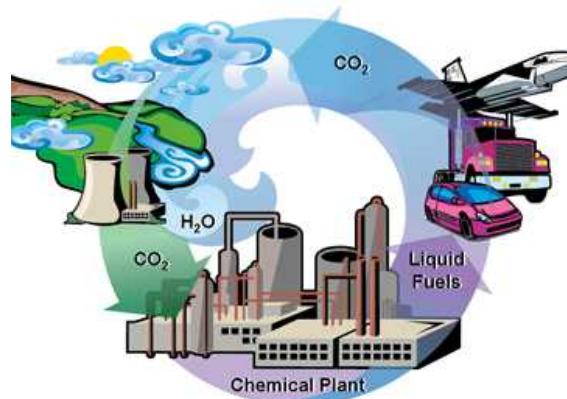
Preserve Historical Information



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

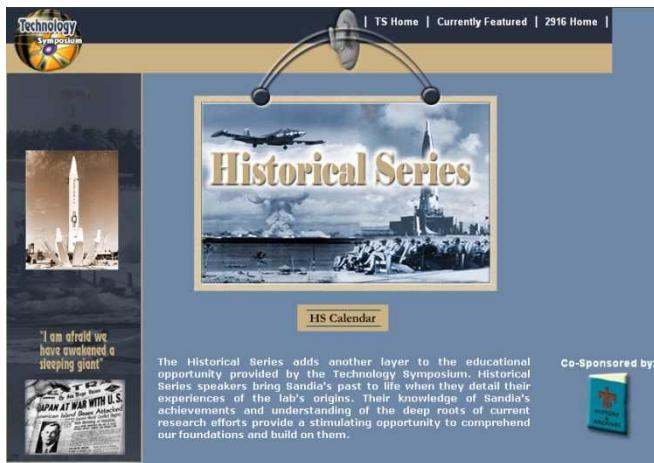


Technology Symposium Series

Capturing Technical Expertise

Methods / Tools

Example: Technology Symposium lecture series, Mark Boslough, 2009



Series Goals:

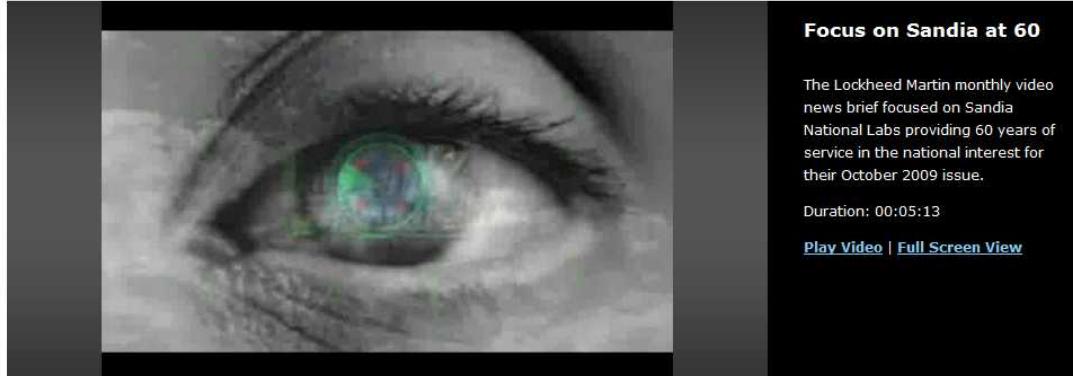
- ▶ Provide forum for Sandians to engage in learning opportunities and knowledge sharing both inside and outside their areas of expertise.
- ▶ Promote networking opportunities and Point of Contact information.
- ▶ Address current trends of technological significance, approaches to innovation, and technology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



[Mission Execution](#)

[See All](#)

[PLAY](#)

Community Service



[Building a Better Future Together
\(State of the Labs 2008 Opening Video\)](#)

[See All](#)

[PLAY](#)

Energy



[Solar Note](#)

[See All](#)

[PLAY](#)

Recruiting



[Work/Life Balance](#)

[See All](#)

[PLAY](#)

Media B-Roll



[Rhythm and Booms](#)

[See All](#)

[PLAY](#)

National Security



[Homeland Security and Defense Force Protection](#)

[See All](#)

[PLAY](#)

Science/Engineering



[Plasma Flame Thermal Spray](#)

[See All](#)

[PLAY](#)

Featured Video



[Focus on Sandia at 60](#)

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



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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

Sandia National Laboratories Public Streaming Archive - Windows Internet Explorer

http://mediasiteson.sandia.gov/mediasites/Catalog/pages/catalog.aspx?catalogId=7402e84d-48e4-467e-813c-0ecd42ca3d08&folderId=

Favorites Suggested Sites Web Slice Gallery CCHD CSU Information SEEMS Web Mail SNL Directory SNL Index Google

Sandia National Laboratories Public Streaming Ar...

SNL events

Video Streaming

Streaming supported by Video Services

Welcome Guest Login

Sciences & Engineering

From here you have access to all multi-media & video only streams contained in the folders on the left. You can click on a folder to scroll or use the search tool for a specific topic or category. The search tool is full text of all associated metadata (Title, Description, etc.). By selecting the Search Tool drop down menu you have 3 options for refining focus and a check box for searching only the selected folder. You can also limit your search by date and type of presentation. In the upper right corner of this box are icons for each folder enabled for you to EMAIL a link to that folder; an RSS FEED that you can subscribe to for notification when new program content is added; a LINK TOOL to give you an HTML link for the folder to add it to a web page or to paste in an IM message.

Page: 1 of 3 Search: Displaying presentations 1 to 10 of 30

Sort By: Name | Date ▾ | Presenter | Type Air Date: To: Type: All apply clear

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

mediasite Catalog version 5.3.0

Local intranet | Protected Mode: Off

100%

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



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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 10/15/2010 End Date 10/29/2010

► Include:

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

Total Views / Presentation

Style View



 Sandia
National
Laboratories

Media Site

Report Summary

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

Unique Presentations Unique Users Total Views Peak Connections

501 of 2380 1745 3399 61

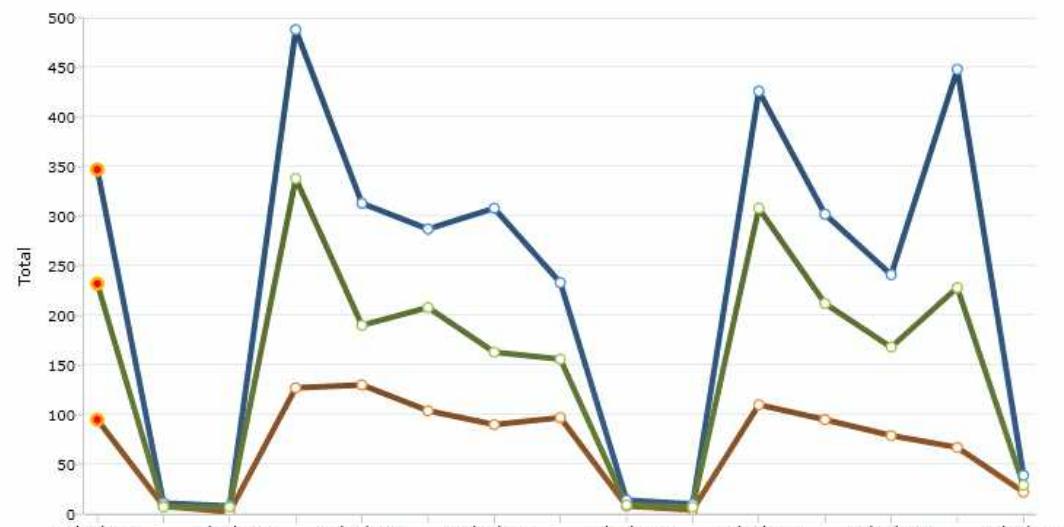
Date Range: Start Date End Date

▶ Include:

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

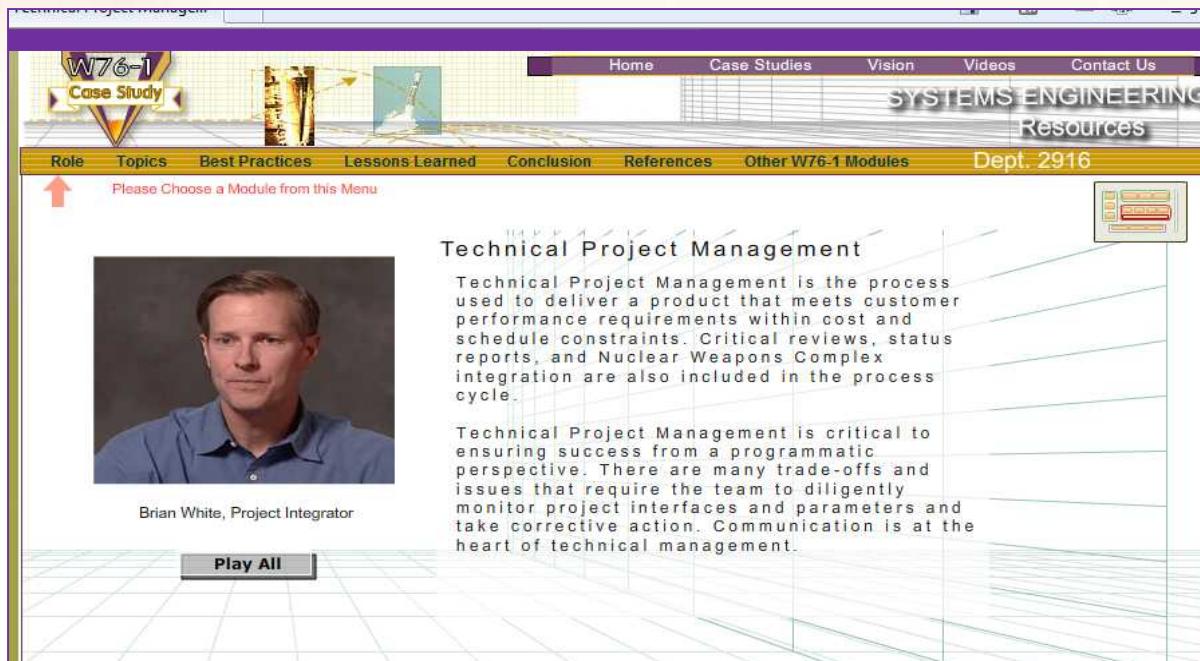
[Date Activity](#) [Browser Statistics](#) [Platform Statistics](#) [Player Statistics](#)[View](#)

Server Activity / Date

 Total Views Unique Presentations Unique Users Live Users On-Demand Users Peak Connections Sandia National Laboratories

Systems Engineering Case Studies Project

Professional Development – Just in Time Learning Applications



The screenshot shows a web page for the W76-1 Case Study. At the top, there's a navigation bar with links for Home, Case Studies, Vision, Videos, and Contact Us. Below that is a sub-navigation bar for SYSTEMS ENGINEERING Resources, with links for Role, Topics, Best Practices, Lessons Learned, Conclusion, References, Other W76-1 Modules, and Dept. 2916. A message says 'Please Choose a Module from this Menu' with a red arrow pointing up. The main content area features a portrait of Brian White, a Systems Engineer, with the caption 'Brian White, Project Integrator'. Below the portrait is a 'Play All' button. The main text block is titled 'Technical Project Management' and describes it as the process of delivering a product within cost and schedule constraints, mentioning critical reviews, status reports, and Nuclear Weapons Complex integration. Another text block discusses the critical nature of technical project management for success, mentioning trade-offs and communication.

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?)



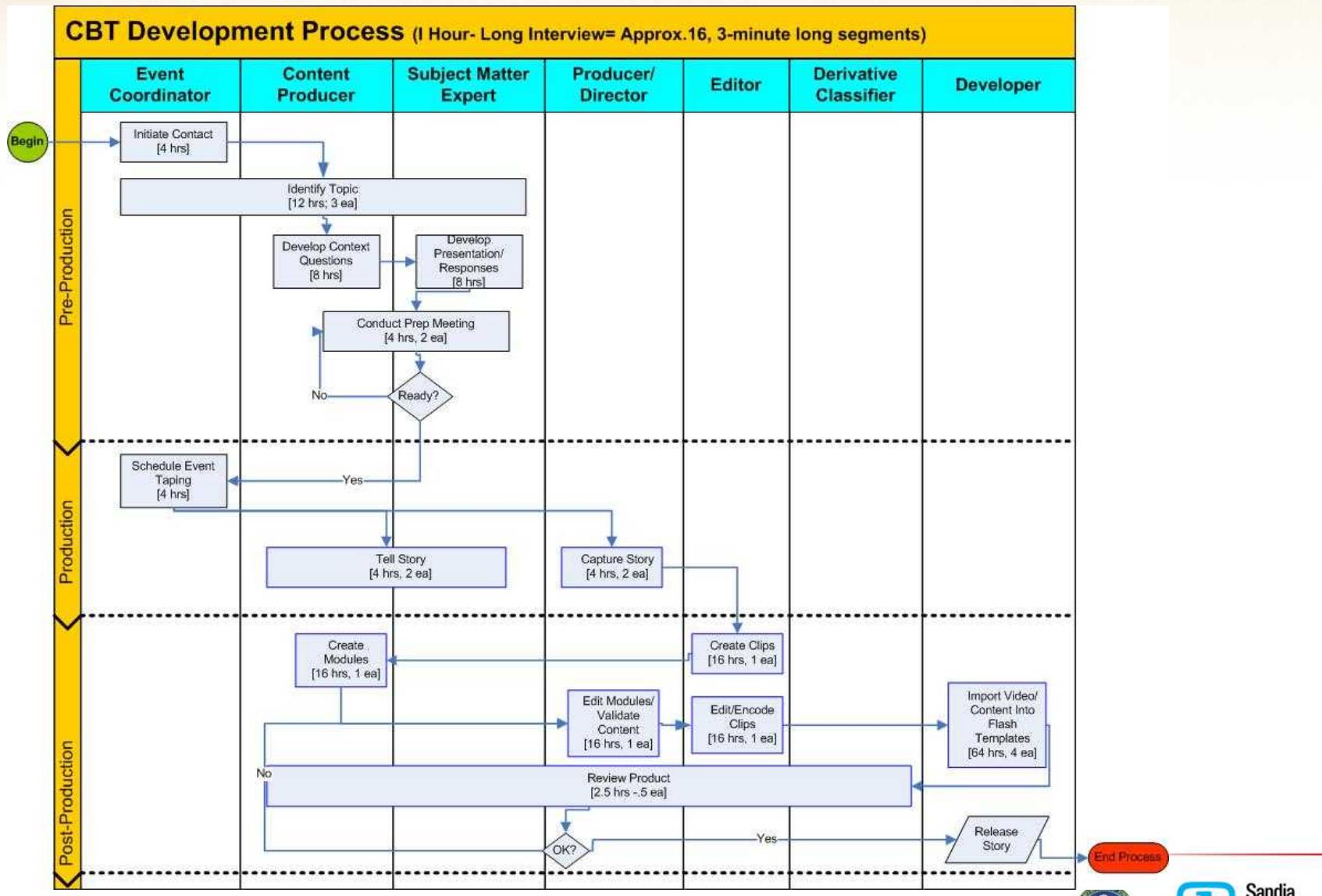


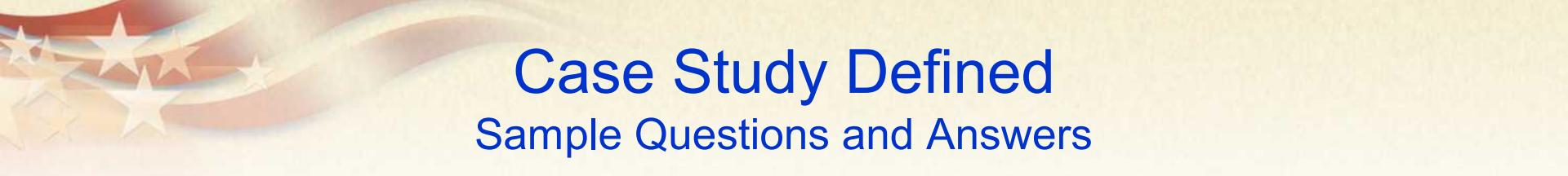
Elements of Video Case Studies

- 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





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

Sandia's Vision for Systems Engineering Practices
Steve Rottler, Vice President, Weapons Engineering and Product Realization

Every successful project has executive sponsors and champions who endorse the effort. Steve Rottler, Vice President of Sandia's Weapons Engineering and Product Realization Center, shares his vision, challenges, goals, and commitment to the development, implementation, and use of an integrated Systems Engineering effort at Sandia. He also discusses how Systems Engineering is needed to maintain a competitive edge.

Skip to a Topic in the Video

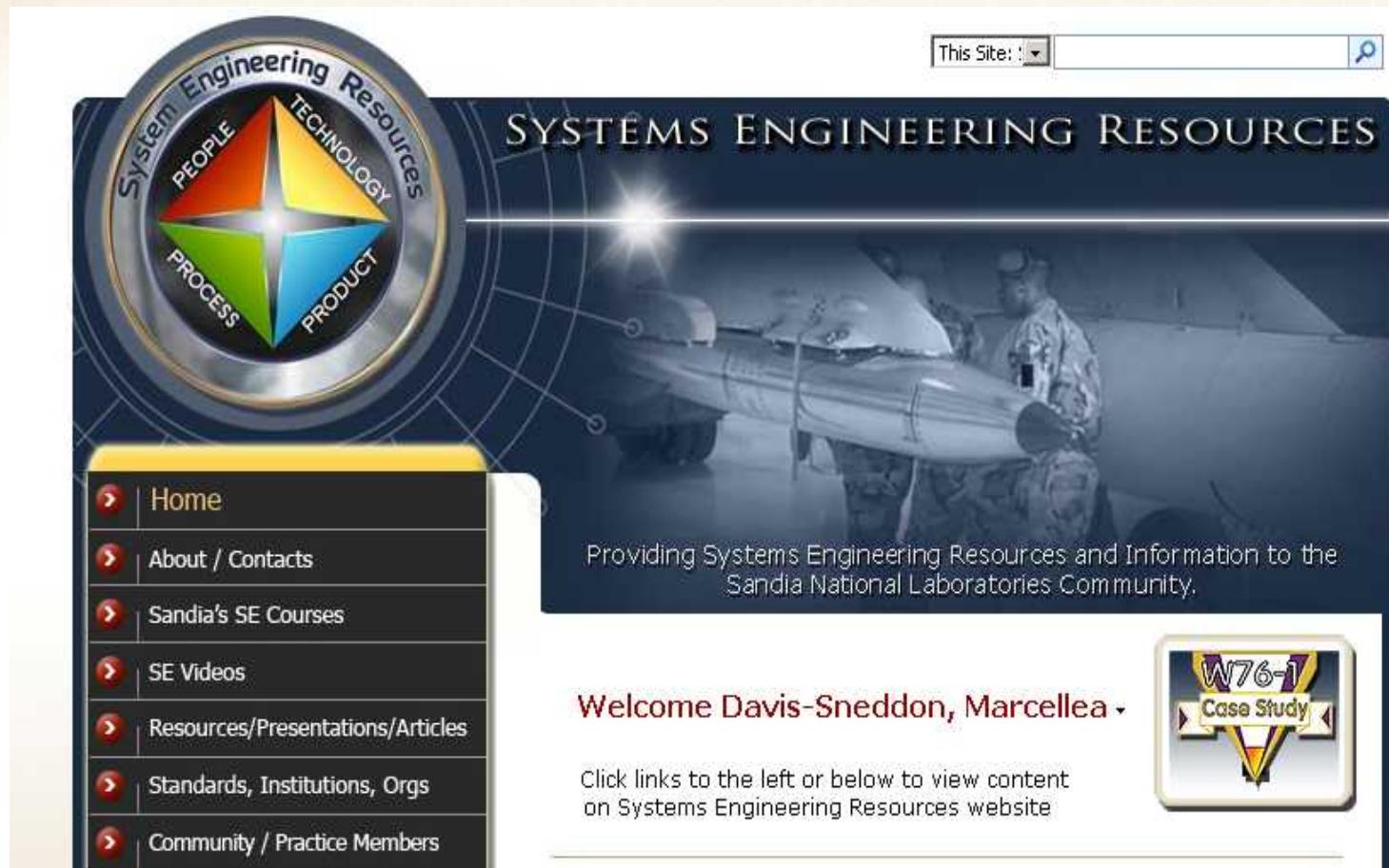
- ▶ Outstanding Technical Excellence
- ▶ New Engineering Excellence Opportunities
- ▶ Systems Engineering Discipline
- ▶ Professional Organizations

ASME INCOSE IEEE STEVENS Software Engineering Institute Carnegie Mellon



Evolution of Just-in-Time Learning Products

Skills and Task Training



The screenshot shows the homepage of the Systems Engineering Resources website. At the top right is a search bar with a dropdown menu labeled "This Site:" and a magnifying glass icon. To the left of the search bar is a circular logo with the text "System Engineering Resources" around the top edge and "PEOPLE", "TECHNOLOGY", "PROCESS", and "PRODUCT" at the four points of a star in the center. The main title "SYSTEMS ENGINEERING RESOURCES" is displayed in large, white, sans-serif capital letters. Below the title is a black and white photograph of a man in military-style clothing standing next to a large aircraft. A text overlay on the right side of the image reads: "Providing Systems Engineering Resources and Information to the Sandia National Laboratories Community." On the left side, a vertical navigation menu is visible, enclosed in a yellow-bordered box. The menu items are: Home, About / Contacts, Sandia's SE Courses, SE Videos, Resources/Presentations/Articles, Standards, Institutions, Orgs, and Community / Practice Members. Each menu item has a red circular icon with a white arrow pointing right to its left.

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



Advertising



Sandia National Laboratories



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.](#)



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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- eFlyers
- Internal News
- Links to Website

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..**



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

