SAND2010-7730C

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 National Laboratories

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

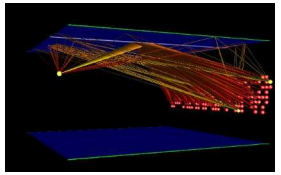
Critical Resources

Efficiency

Homeland Security and Defense

Chem-Bio Defense

Cyber Protection



Explosives Countermeasures

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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.

Engaging the learner through the use of electronic media

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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 Symposiums
- KM Capabilities

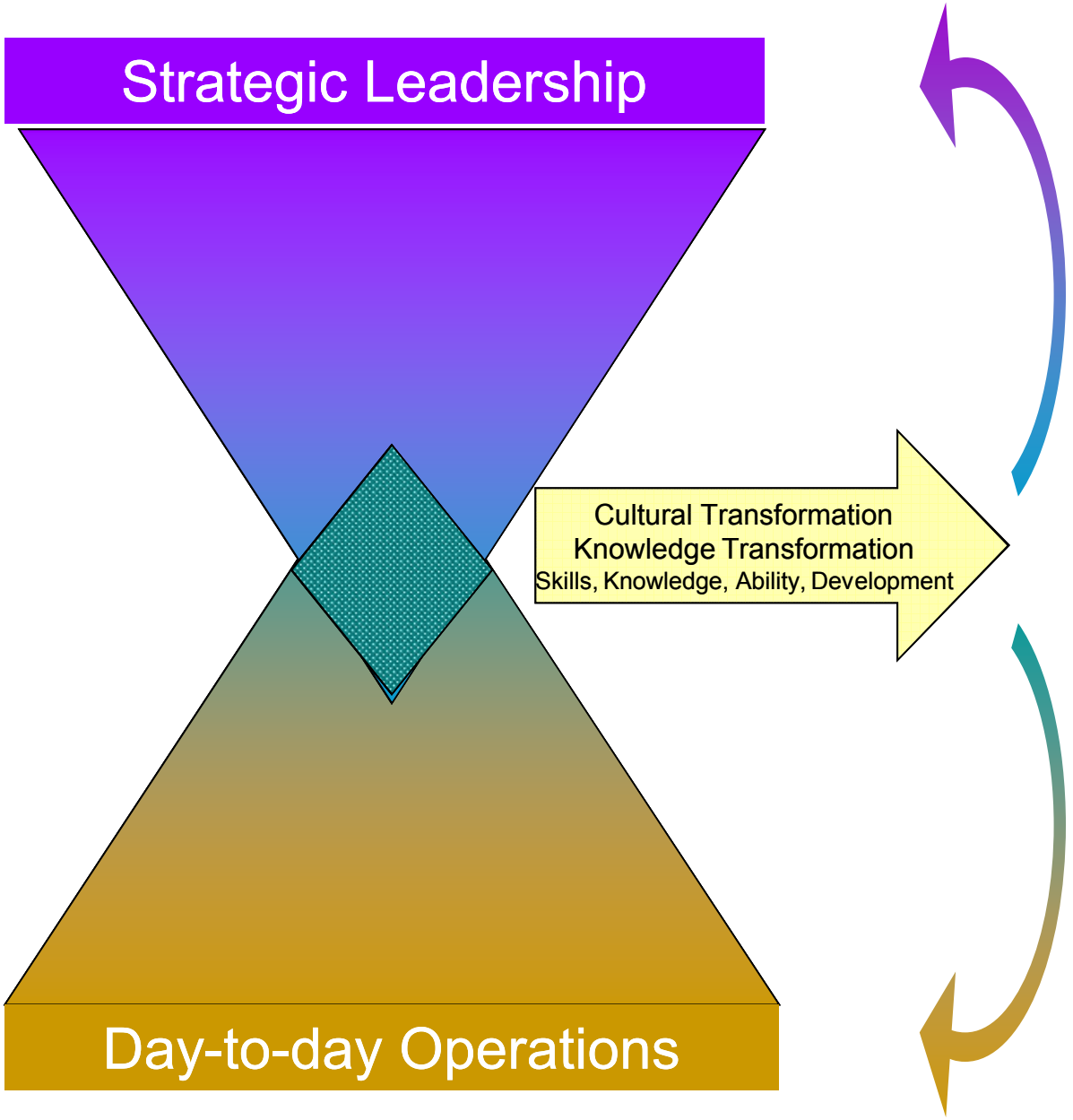
Professional Development

- 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



Adapted from Source: Marsick & Watkins (1999)

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

Highlights Searchable Text Results using Transcripts, Slide Content and description

Media Site

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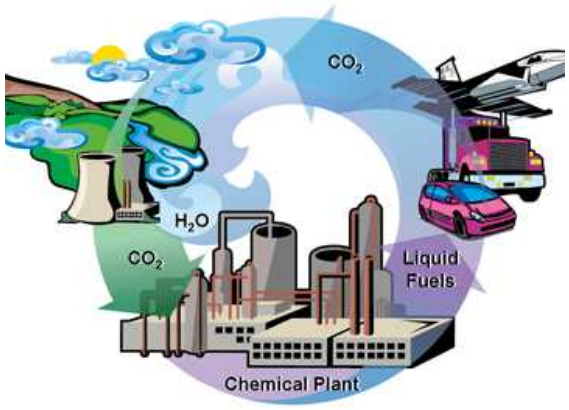
Present Knowledge-Base is Future Knowledge Preservation

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

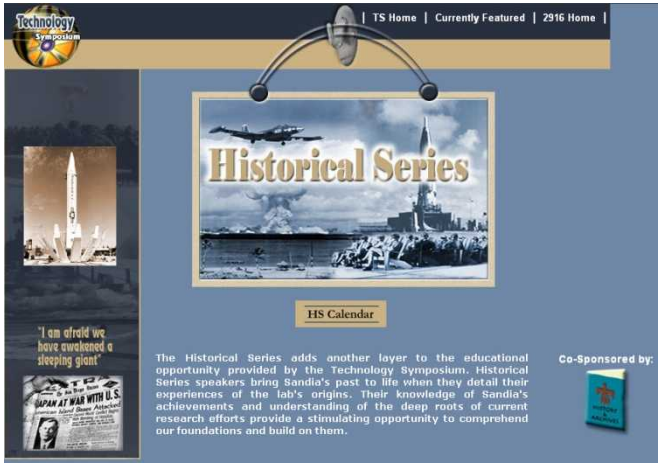
- Identify knowledge about current and historical events that are relevant today and in the future
  - Use forums to make the information available
  - Build Communities of Practice
- Identify what knowledge is at risk – then take action
  - Get management to own and actively engage in the process
  - 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.**

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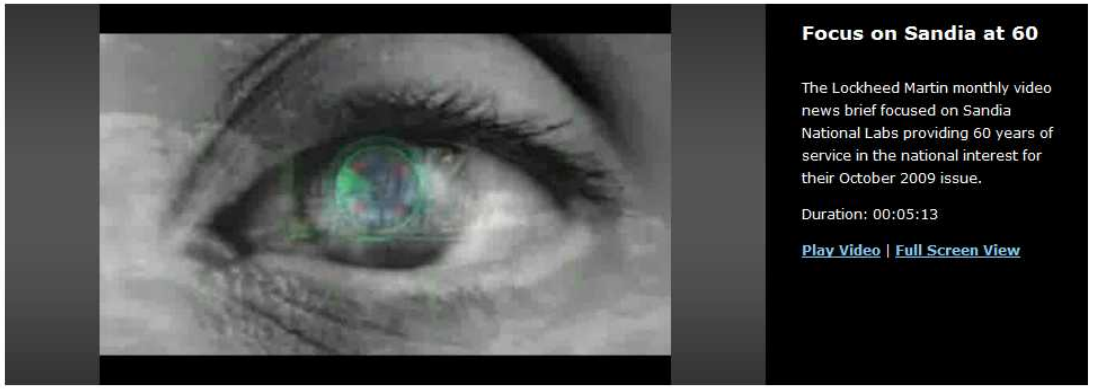
Media Site

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.



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/

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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 it 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.

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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.

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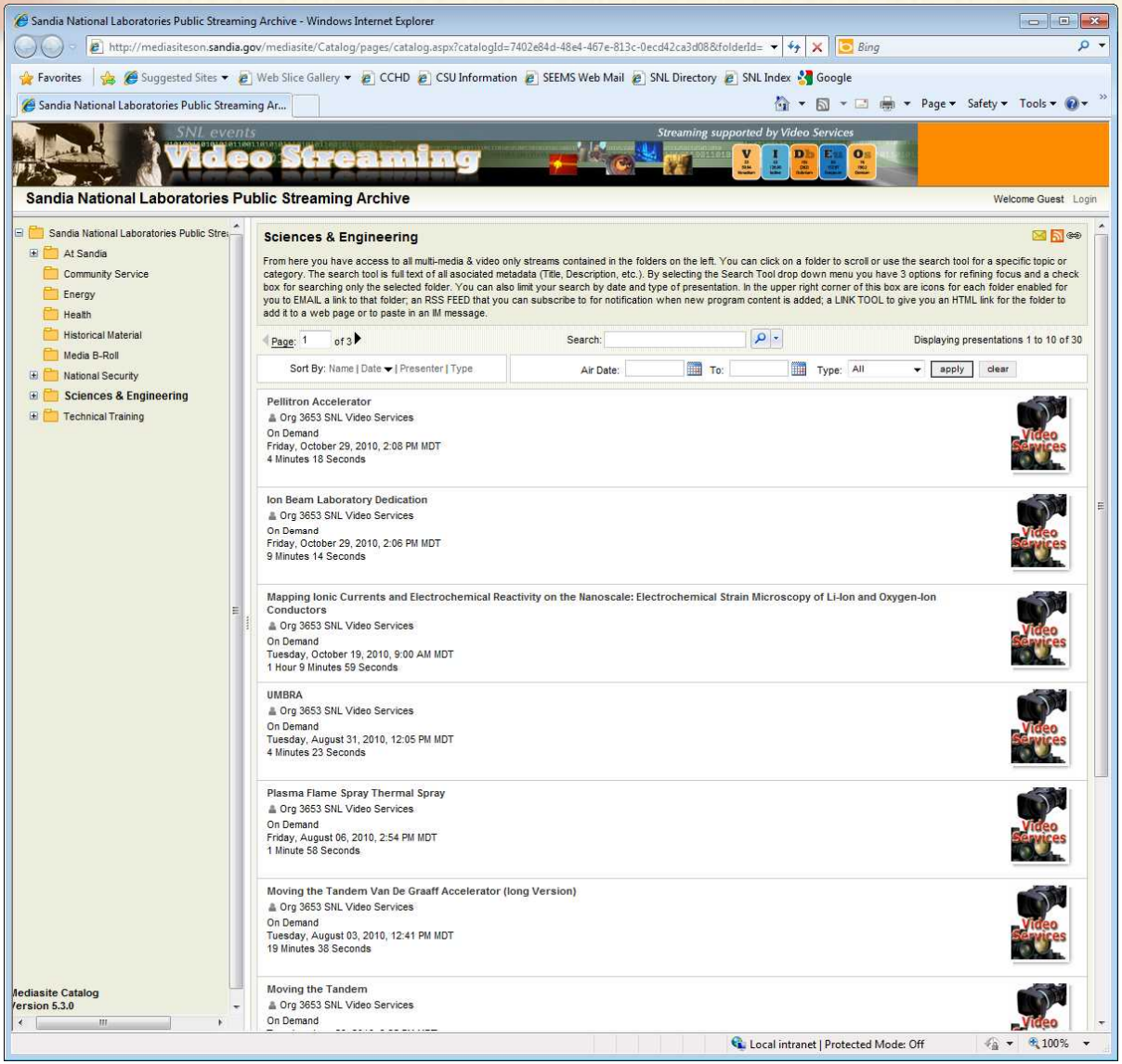
Media Site



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

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Media Site

Report Summary Print | Export

Name: Weekly Presentation Statistics

Date Range: Custom dates

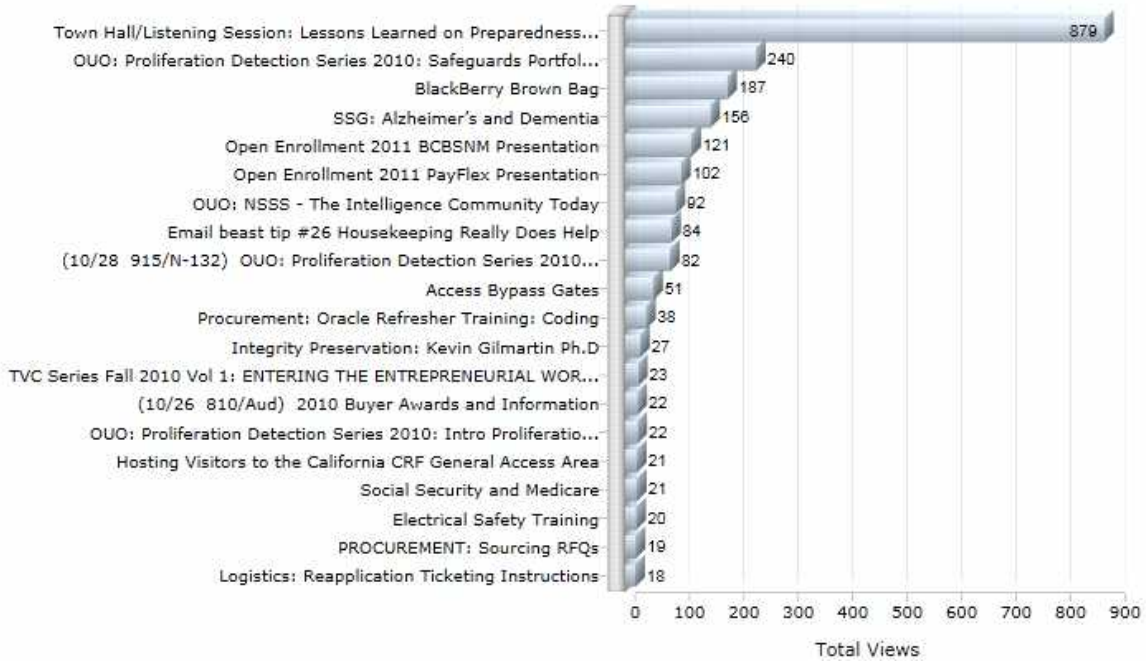
Start Date: 10/15/2010 End Date: 10/29/2010

▸ Include:

Presentations Watched	Total Views	Total Time Watched (h:mm:ss)
501 of 2380	3397	1084:23:20

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

Total Views / Presentation Style View



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Media Site

Report Summary Print | Export

Name: Weekly Server Statistics

Unique Presentations	Unique Users	Total Views	Peak Connections
501 of 2380	1745	3399	61

Date Range: Custom dates

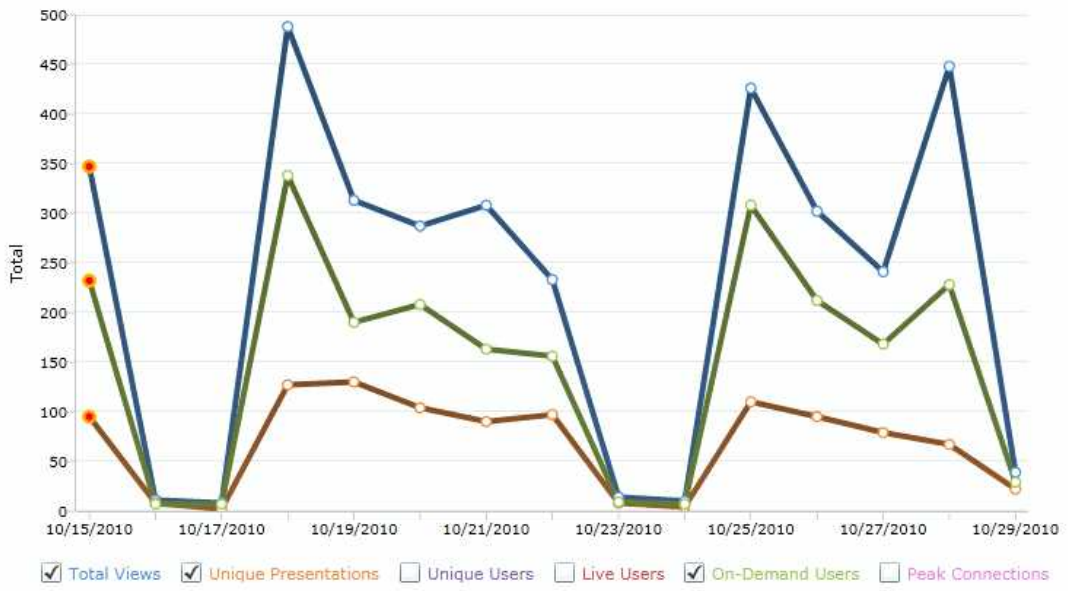
Start Date: 10/15/2010 End Date: 10/29/2010

▸ Include:

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

Date Activity | Browser Statistics | Platform Statistics | Player Statistics

Server Activity / Date View



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Systems Engineering Case Studies Project

Professional Development – Just in Time Learning Applications

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?**

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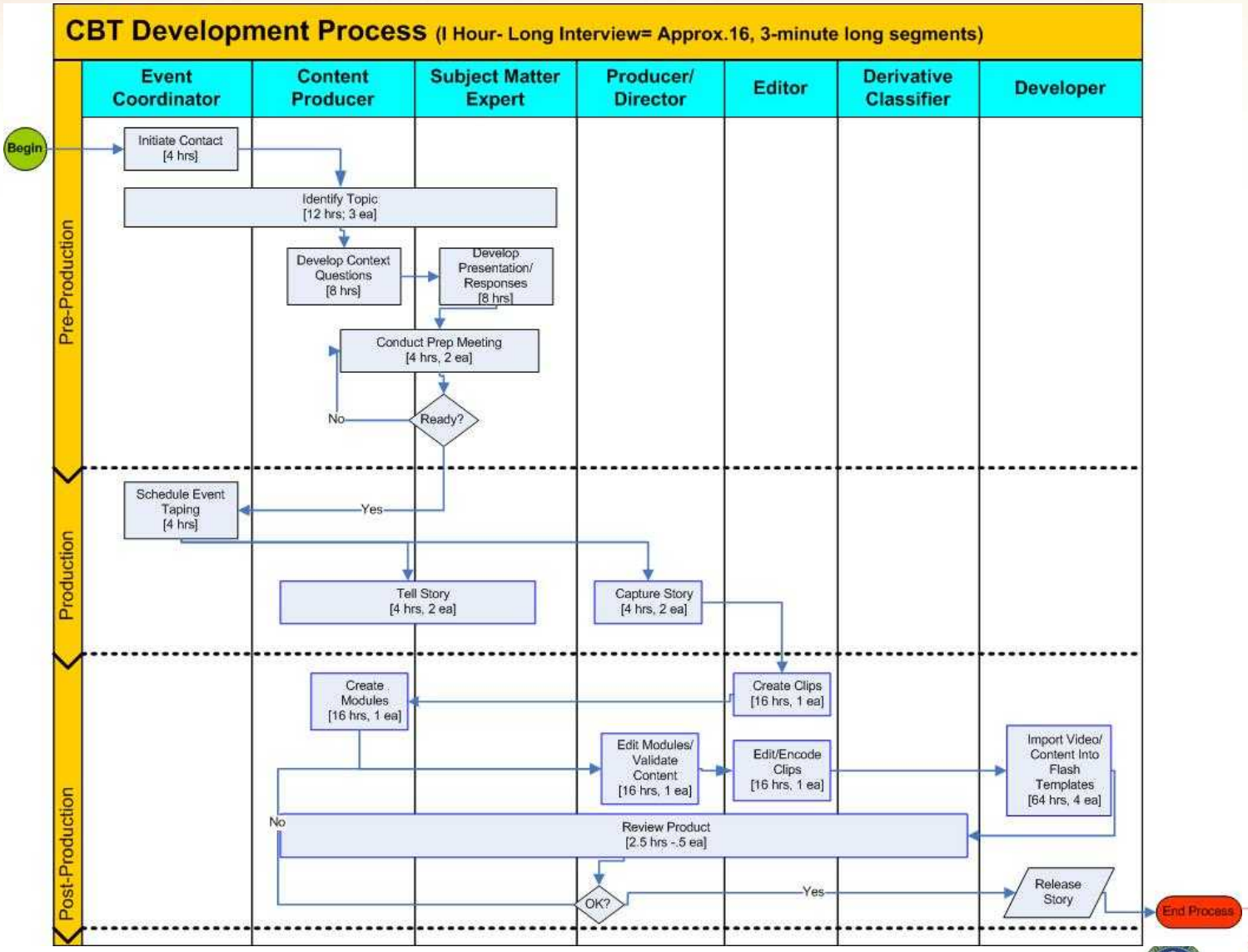
Elements of Video Case Studies

- **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



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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**	1. **Q) What is your name and where do you work?-A) Brian White, Systems Engineer SNL** 2. **Q) What was your role and responsibilities on the LEP project? A) Project Integrator** 3. **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

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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

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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**

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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**

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Advertising

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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.

- eFlyers
- Internal News
- Links to Website

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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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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**

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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/

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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