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Curriculum Planning and Development and Introduction to Instructional Systems Design (ISD)

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SAND
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Presentation Purpose

- **Introduce the Instructional System's Design (ISD) process**
- **Discuss how this process applies to the PAS's**

Note: This presentation will only focus on the Instructional Systems Design process, deliverables for the PAS's will not be discussed.

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Definitions

Instructional Systems Design (ISD): A systematic approach to designing and developing training, education, and development programs that ensures an organization gets the most from it's resources.

Curriculum**:** *A set of courses and other learning experiences constituting an area of specialization.*

Course: *a number of lectures or other matter dealing with a subject; also : a series of such courses constituting a curriculum*

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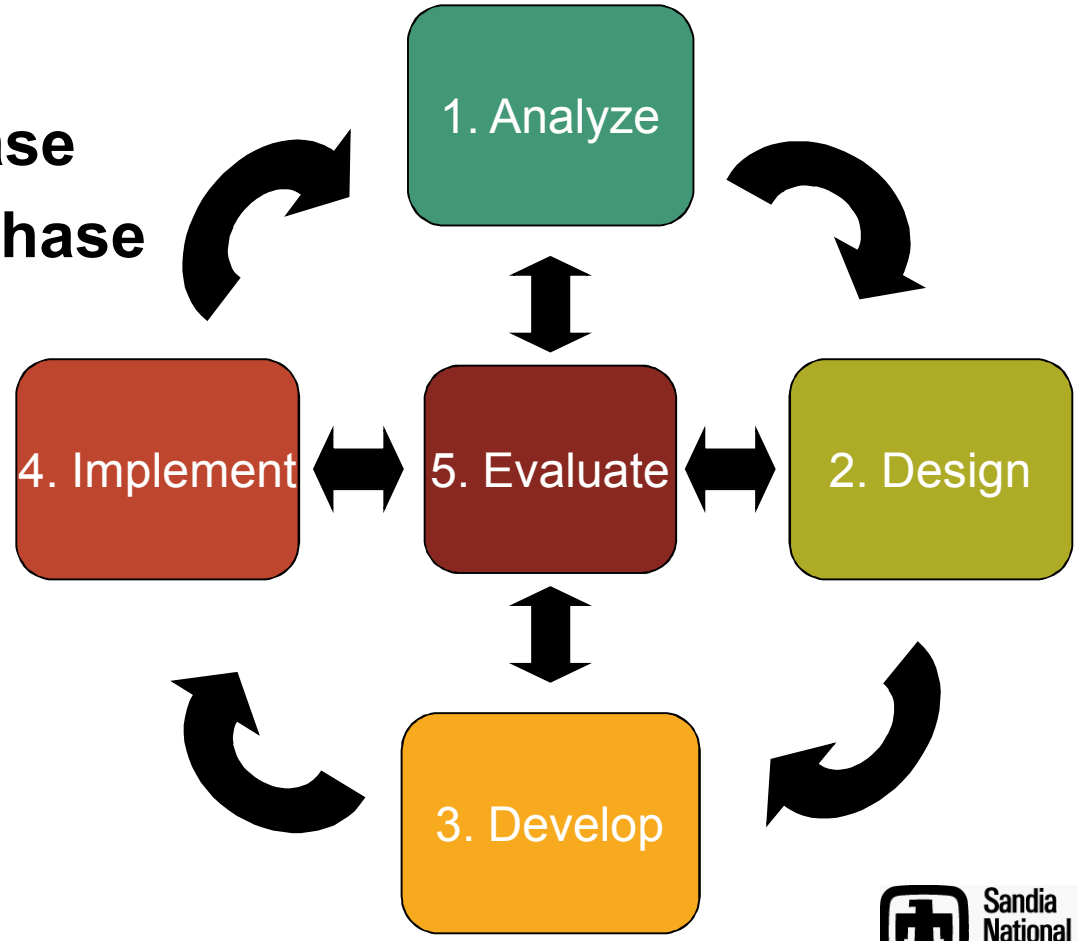
5 Phases of ISD

1. Analysis Phase
2. Design Phase
3. Development Phase
4. Implementation Phase
5. Evaluation Phase



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1. Analysis Phase

1.1 Define the curriculum purpose and scope

1.2 Conduct Needs Assessment

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1.1 Define Curriculum Purpose and Scope

Curriculum purpose

- (Why should this curriculum exist?)
- (What will the curriculum focus on?)
- (What audience is it for?)

Curriculum scope

- (What will this curriculum include/ not include?)

Note: This needs to be developed before any additional work can progress. Is it possible to answer these questions, during this trip and draft a document next week?

1.2 Conduct Needs Assessment

Needs Assessment: *A process of identifying needs, who it affects, how it affects them, and what results can be achieved by training and other educational tactics.*

Steps:

- **Identify participants**
- **Identify technique** (survey, focus group, observation)
- **Develop assessment tools** (based on the curriculum purpose and scope)
- **Conduct Assessment**
- **Compile and analyze data**

2. Design Phase

2.1 Identify a curriculum structure

2.2 Determine course design

2.3 Develop design document for each course

2.1 Identify a Curriculum Structure

Curriculum: *A set of courses and other learning experiences constituting an area of specialization*

Curriculum Structure: *A visual representation of a curriculum.*

Steps

- **Identify tracks**
- **Identify course titles and basic descriptions within tracks**

Engineering Curriculum Structure

Electrical Engineering	Nuclear Engineering	Industrial Engineering
General Chemistry I	Principles of Nuclear Engineering	General Chemistry I
Circuit Analysis	Neutron Diffusion	Modeling and Simulation
Computer Logic Design	General Chemistry I	Manufacturing Processes

Title and Description

Introduction to Chemistry: An overview of the fundamental concepts in chemistry. Topics will include a discussion of the classification of matter, the fundamental laws of chemical combination, the atomic theory and chemical bonding. The stoichiometry of chemical reactions will be presented. Several types of chemical reactions will be discussed, including precipitation reactions, oxidation-reduction reactions and acid-base reactions. Topics in organic and biochemistry will be considered. Lectures will include numerous examples and demonstrations of chemical principles. Extensive laboratory exercises will further illustrate concepts discussed during the lecture hours.

2.2 Determine Course Design

- **Determine course:**
  - Audience
  - Goal
- **Determine course modules and learning objectives for each module**
  - *Course Modules:* Learning components of the course
  - *Learning Objective:* A statement of what learners should be able to do after the instruction or of the intended result of instruction
- **Choose instructional strategies and methods (i.e., lecture, text, exercises, or online)**
- **Evaluation and design plan (what did they learn?)**

2. Develop Design Documents

For each course that was identified in the curriculum structure, write a design document, this should include:

- **Target Audience (description of learners)**
- **Prerequisites**
- **Delivery method**
- **Course Goal and Outcomes**
- **Course Content Outline (Including module objectives)**
- **Development Schedule**
- **Resources**

3. Development Phase (for each course)

- **Create course materials**
  - Use the objectives to write text, slides, and exercises for each section
  - Determine what resources are necessary (posters, computers, etc.)
- **Create instructor manual**
  - Lecture notes
  - Exercise solutions
  - Time allotment and lesson plans
- **Create evaluation instruments**
  - Tests or quizzes
  - Final exercise with a checklist
  - End-of-course evaluation form
- **Test course materials**
  - Revise where needed

4. Implementation Phase (for each course)

- **Materials are now ready to be utilized!**
  - Determine instructors
  - Train the trainer
  - Present the final course

5. Evaluation Phase

- **Review the results of evaluation tools, quizzes, and end-of-course evaluation form to determine what the students learned.**
- **Record and review instructor comments and observations about rough areas and ideas for improvement for next time.**
- **Use student comments and quiz scores to identify problem areas and fix them for the next course.**

Note: This phase generally focuses on individual courses, but can also focus on the entire curriculum after enough data has been gathered and evaluated.

What Are the Benefits of ISD?

1. By focusing from the beginning on what the learner is to know or be able to do when the instruction is concluded, the subsequent planning and implementation steps become clear and effective.
2. Careful linkage between components results in successful learning.
3. Avoid course activities that may not be related to what is to be to be learned, and therefore increase effectiveness of planned activities.

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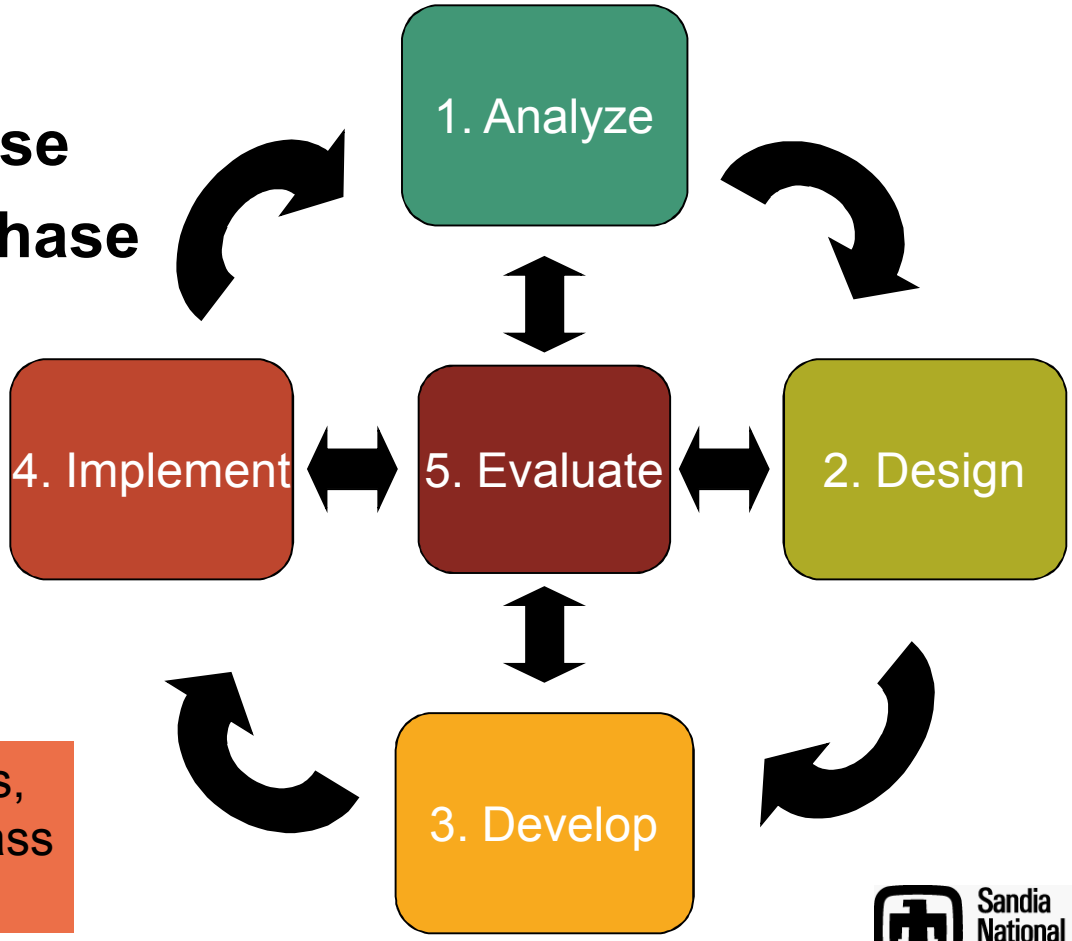
What Are the Benefits of ISD?

4. Systematic instruction is an empirical and replicable process. It is reusable and worth the time and effort to evaluate and revise. By conducting evaluation, you can determine what is not working and revise it.

5. Creating strong, useful curriculums and courses that can be tailored to individual needs will enhance safety and security at your facility.

Summary

1. Analysis Phase
2. Design Phase
3. Development Phase
4. Implementation Phase
5. Evaluation Phase



Note: Following the ISD Process, will allow you to have a first class training program.

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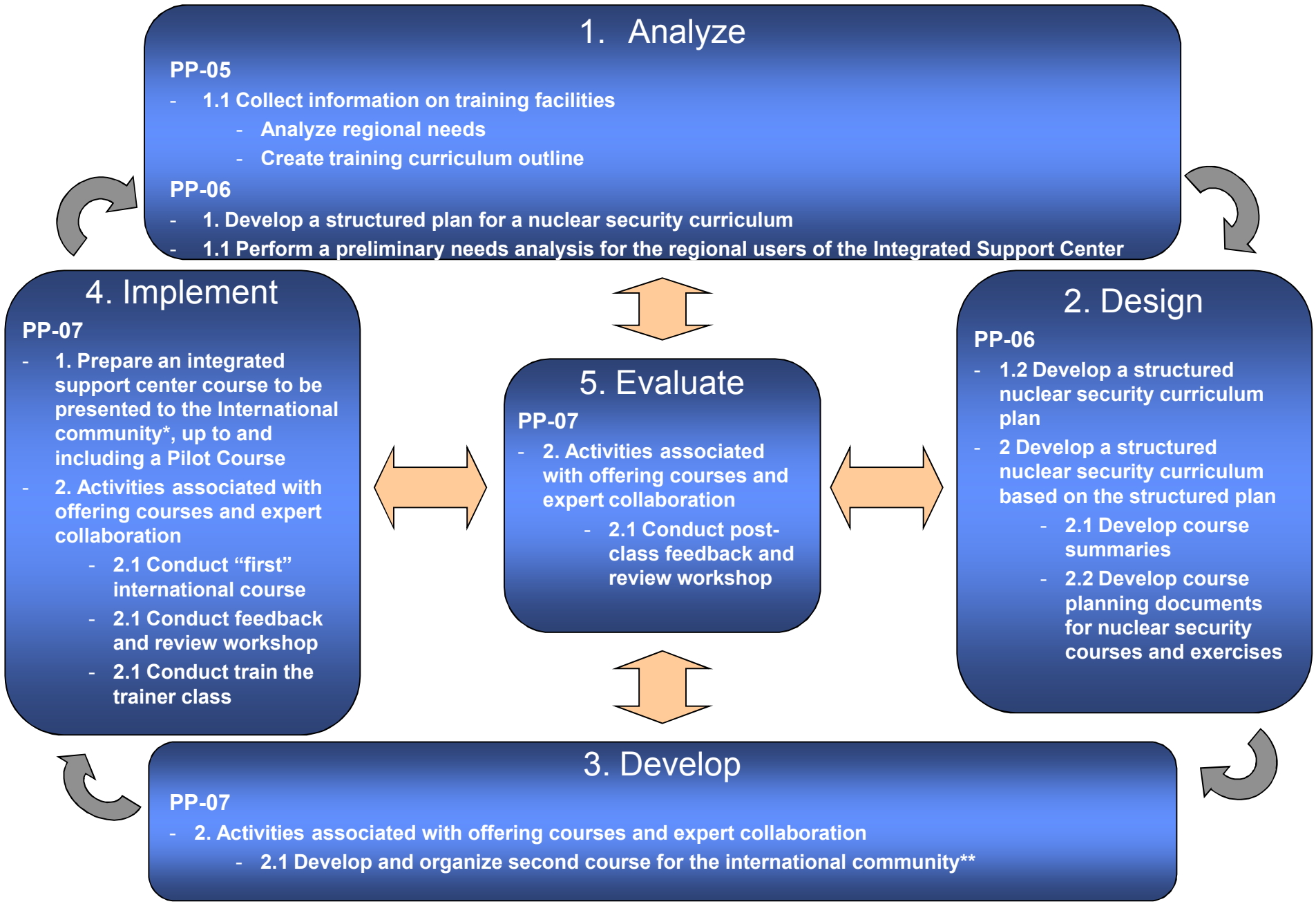

*** Using an existing training course.**

**** Based on design document, support Japan in developing, implementing, and evaluating a new training course.**

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Adult Learning Tips

- Adults are most likely to engage and learn if the topic applies to something that is important to them.
- Adults need to actively participate; the more they can hear, see, and experience, the better they will understand.
- Adults like to solve problems, accomplish things.
- Adults desire feedback to calibrate how well they are doing.
- Adults are goal-oriented; they want to know what the goal is and when they have reached it (feel a sense of accomplishment.)

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PAS's 5-7 (on two slides)

- Note that these can be interpreted as two "spirals" through the ISD process, the first being partial (starting with Implement) and the second being the full process

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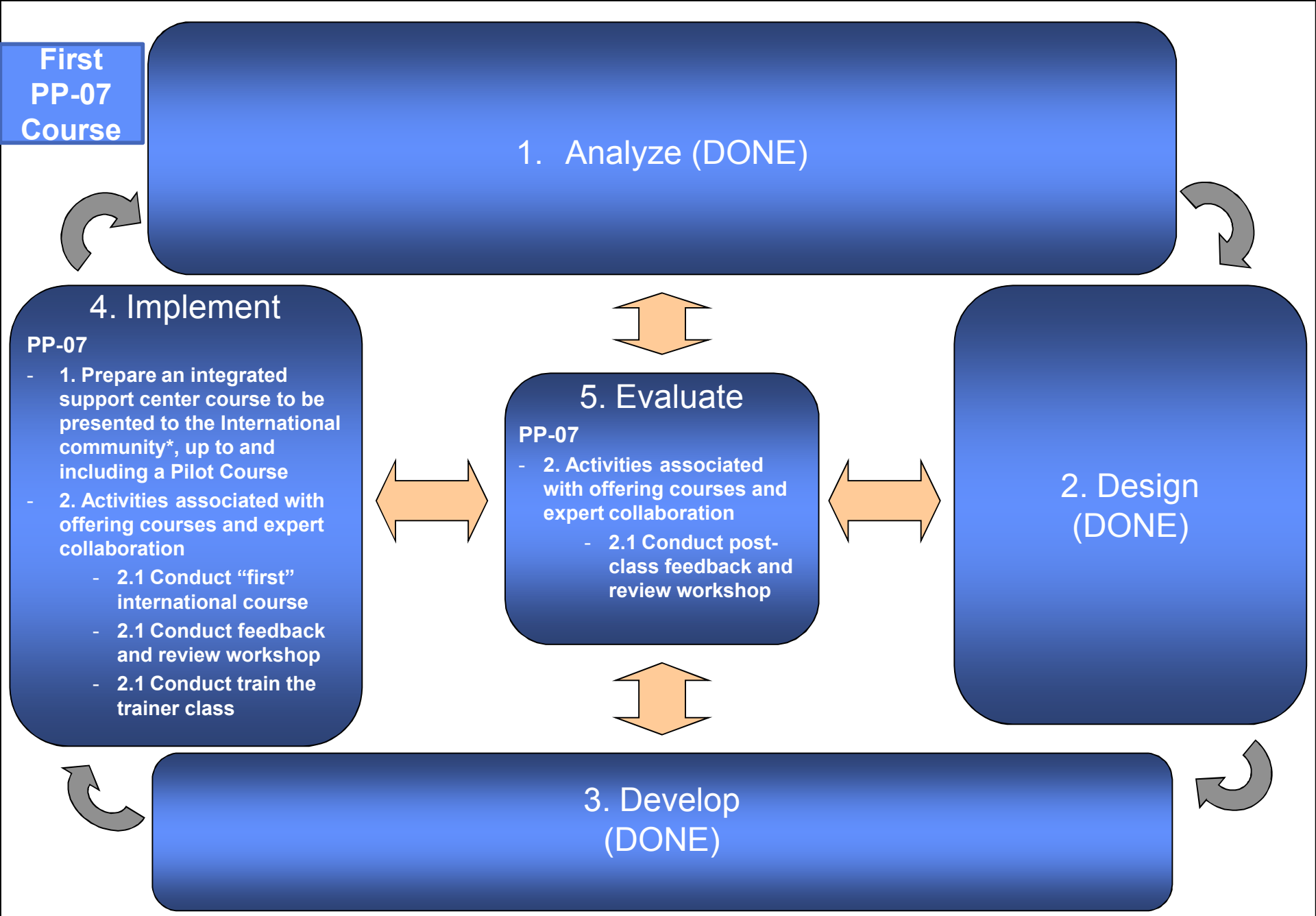

*** Using an existing training course.**

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Second PP-07 Course

1. Analyze

PP-05

- 1.1 Collect information on training facilities
  - Analyze regional needs
  - Create training curriculum outline

PP-06

- 1. Develop a structured plan for a nuclear security curriculum
- 1.1 Perform a preliminary needs analysis for the regional users of the Integrated Support Center

2. Design

PP-06

- 1.2 Develop a structured nuclear security curriculum plan
- 2 Develop a structured nuclear security curriculum based on the structured plan
  - 2.1 Develop course summaries
  - 2.2 Develop course planning documents for nuclear security courses and exercises

3. Develop

PP-07

- 2. Activities associated with offering courses and expert collaboration
  - 2.1 Develop and organize second course for the international community**

4. Implement

PP-07

- 1. Prepare an integrated support center course to be presented to the International community*, up to and including a Pilot Course
- 2. Activities associated with offering courses and expert collaboration
  - Based on design document, support Japan in implementing a new training course.

5. Evaluate

PP-07

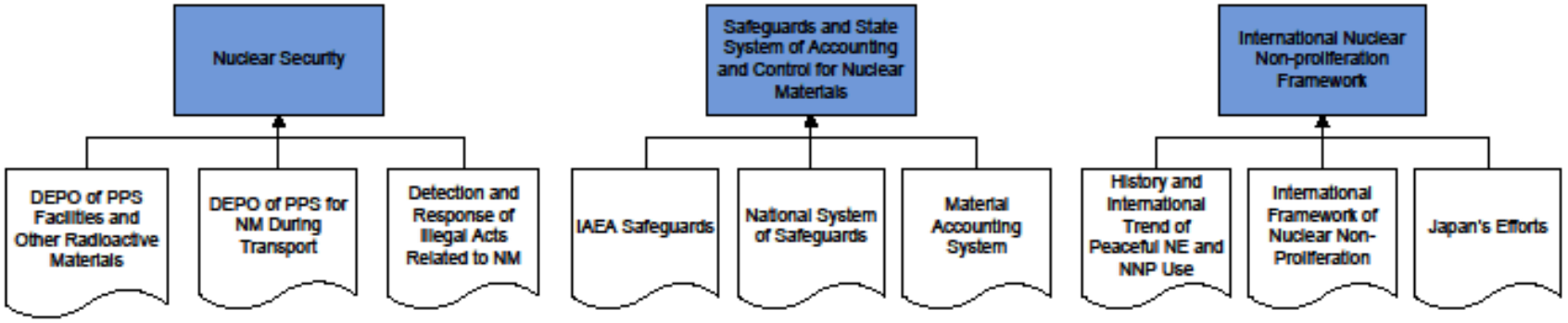
- 2. Activities associated with offering courses and expert collaboration
  - Based on design document, support Japan in evaluating a new training course.

* Using an existing training course.

** Based on design document, support Japan in developing, implementing, and evaluating a new training course.

Japan Program Map

Based on MEXT and JAEA Documents



4 Types of Courses

1. International Course: 2 weeks/ Japan/ English
2. Dispatched Courses: 2 days-1 week/ Local Language
3. Domestic Course: 1 week/ Japanese
4. Education Program Collaboration with Universities

Collaboration Scheme

Basic Planning for Initial 2-Year Period