



OIL AND GAS SECURITY EXERCISE MODEL PROCEDURE

SESSION 1 – OIL AND GAS SECURITY STUDIES

**The 1st APEC Oil and Gas Security Network Forum
23 April 2015, Kitakyushu City, Japan**

**Chrisnawan ANDITYA
Senior Researcher, APERC**



**Asia-Pacific
Economic Cooperation**



Incidents in Oil and Gas Facilities



Illustration by Kong Yink Heay;
<http://magazine.scientificmalaysian.com/issue-6-2013/enhancing-safety-sustainability-malaysian-refineries/>

- “ No one knows when it will be come or occurred.
- “ It might trigger disruptions of oil/gas supply.
- “ It might affect the continuation of other related sector services.
- “ It might lead to serious economic impact.



Effective implementation of measures, response and recovery strategies need to be ensured.

- “ System (e.g. policies, plans, procedures, and communication protocols); and
- “ Personnel.



What is an Exercise?

Exercise is the process to train for, assess, practice, and improve performance and capacity in an organization.

- “ Through a simulated situation;
- “ To evaluate the performance and capacity of system and personnel.





Why Exercise?



- “ Validate and test the system;
- “ Clarify and train personnel on their roles and responsibilities;
- “ Improve institutional framework;
- “ Identify gaps in resources;
- “ Identify opportunities for improving the system and personnel; and,
- “ Find the best solution and strategy to cope with oil and gas supply disruptions.

Source: APERC, 2013



Element Needs to be Considered

“ **Analyse the Needs.**

- Review current emergency management condition; examine performance and capacity of the system and personnel; identify the performance and capacity of the system and personnel; and determine the needs.

“ **Obtain Commitment and Support from the Top Management.**

- The economy or the government organization; those who have responsibility for an exercise; and other relevant organization.

“ **Establish the Exercise Organization.**

- The exercise programme manager; the exercise project team leader; the members of the planning team; and the exercise project team.

“ **Securing Budget.**

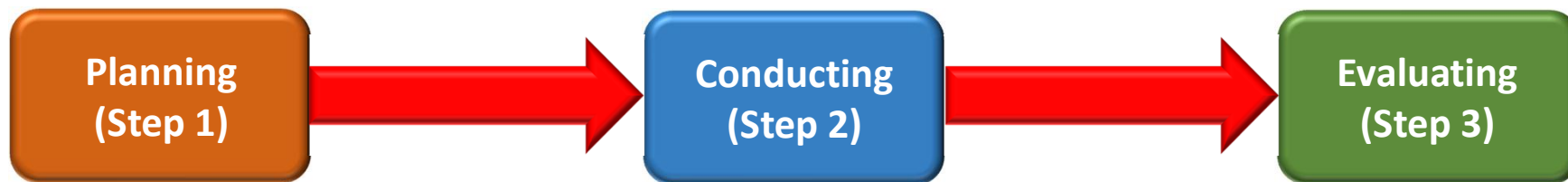
- Allocated based on analysis of the appropriate exercise method and type; and cost sharing with other organizations.

“ **Handling Confidential Data and Information.**

- “Confidentiality Clause”; “Return All Materials containing Confidential Data and Information”, and “Non-Real Name or Generic Name”.



Exercise Programme



- “ Secure the elements of the exercise; and
- “ Establish the exercise programme objectives.

- “ Establish the exercise project team management;
- “ Establish communication;
- “ Establish timeline and schedule of the exercise programme; and,
- “ Provide support and assistance for the activities of the exercise project team

- “ Evaluate the entire exercise programme including individual exercise activity;
- “ Report the entire exercise programme and/or project to the top management



Exercise Project

Planning (Step 1)

- ” Secure the elements of the exercise;
- ” Design:
 - Establish objectives and scope;
 - Select the exercise methods and types;
 - Establish timeline and schedule;
 - Select exercise participants;
 - Institute communication; and,
 - Identify logistical need.
- ” Develop:
 - Develop exercise scenario; and,
 - Develop exercise document.

Conducting (Step 2)

- ” Set up;
- ” Brief participants;
- ” Start the exercise;
- ” Maintain the exercise;
- ” Evaluate activities; and
- ” End the exercise.

Evaluating (Step 3)

- ” Evaluate exercise through debrief;
- ” Provide the exercise final report; and
- ” Exercise follow-ups.



Characteristics of Exercises (1)

A. Discussion-Based Exercises

Types of Exercises	Seminar	Workshop	Tabletop Exercise	Discussion-Based Game
When it should be selected?	Familiarising the staff with the existing system or if the economy or the government organization is developing or making changes to the system.	Increasing performance & capacity of staff in achieving or building new or revised the system. Writing exercise objectives and scenarios.	Assessing the performance & capacity of the system & personnel to respond to an emergency situation.	Assessing the performance & capacity of the system & personnel to respond to an emergency situation.
What is the format?	<ul style="list-style-type: none"> “ Informal discussion. “ An experienced facilitator needs to be assigned. 	<ul style="list-style-type: none"> “ Informal discussion. “ An experienced facilitator needs to be assigned. 	<ul style="list-style-type: none"> “ Discussion of simulated scenarios in an informal setting. “ An experienced facilitator needs to be assigned. “ Involve many people and organizations. 	<ul style="list-style-type: none"> “ Discussion of simulated scenarios in an informal setting by two or more teams. “ An experienced facilitator needs to be assigned. “ Involve many people and organizations.
Time for event	1-2 hours	1-2 hours	2-4 hours or longer up to 3 days.	2-4 hours or longer up to 3 days.
Time for preparation	1 week	1 week	1-3 months	1-3 months

Source: ISO 22398:2013, IOC Manuals and Guides No. 58 and IPIECA-OGP Report Number 515



Characteristics of Exercises (2)

B. Operation-Based Exercises

Types of Exercises	Drills	Functional Exercise	Full-Scale Exercise
When it should be selected?	Testing a single specific performance & capacity of system & personnel in a single organization.	Validating or evaluating performance & capacity of the system & personnel to respond to an emergency situation, particularly those involved in the chain of command and control system.	Evaluating the operational performance & capacity of the system & personnel to respond to an emergency situation as real as possible.
What is the format?	<ul style="list-style-type: none"> “ Conducted by a single organization in one specific task. “ Coordination with other organizations is not necessary. “ A manager, supervisor, or exercise coordinator needs to be chosen as a lead. 	<ul style="list-style-type: none"> “ Coordinated response to a scenario in a time-pressured and realistic simulation. “ Lead by an exercise coordinator. 	<ul style="list-style-type: none"> “ Simulating the actual response conditions in a highly stressful environment. “ Required the mobilization and actual movement of emergency system, personnel, and resources. “ Lead by an exercise coordinator.
Time for event	4-8 hours.	4-8 hours or longer up to 1 or more days.	4-8 hours or longer up to 1 or more days.
Time for preparation	1-2 weeks.	6-18 months.	6-18 months.

Source: ISO 22398:2013, IOC Manuals and Guides No. 58 and IPIECA-OGP Report Number 515



Develop Exercise Scenario

- “ Should describe reasonable potential threats/hazards;
- “ Should be specific and not be too complicated by detail;
- “ Should not be long (5-7 paragraphs);
- “ Outline events to date in chronological order;
- “ Written in a clear language; and
- “ Finish with the current known situation.

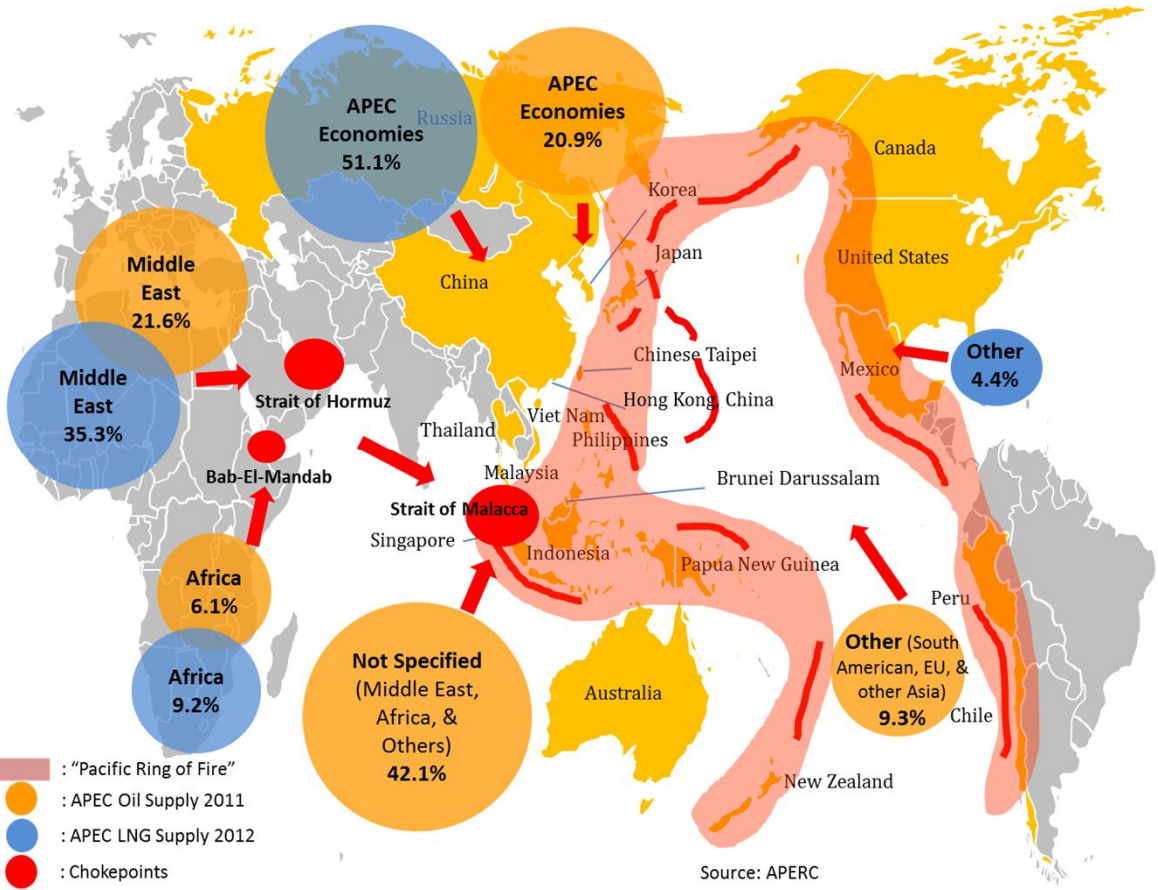
(an example of oil scenario as in the attachment)

Some Potential Threats/Hazards to the Oil and Gas Supply Security

Source	Type of Threats/Hazard	Example
From Inside	Weather Events	Typhoon, Hurricane, Flooding
	Geography Condition	Earthquake, Volcanic Eruption, Landslide, Tsunami
	Terrorists Attack	Bombing, Piracy, Hijacking, Cyber-Attack
	Socio-culture Instability	Labour Issues, Social Unrest, Sectarian Differences, Sabotage
	Accident in Supply Chain	Fires, Oil/Gas Leakage, Malfunction of Systems
	Epidemic of a Disease	MERS, SARS, bird flu
From Outside	Instability in the Middle East, Africa or Other Exporting Oil & Gas Economies	War, Terrorism, Sectarian Differences, Sabotage, Changes in the Government Decision
	Insecurity of Oil and Gas Chokepoint	War, Terrorism, Piracy, Hijacking



Main Facts on Oil and Gas Security in the APEC Region



- “ APEC region aligns with the “Pacific Ring of Fire” along which volcanoes are common and earthquakes occur frequently.
- “ APEC demand on oil and natural gas significantly exceeds internal production and APEC highly relies on outside sources.
- “ APEC oil and LNG imports are highly dependent on maritime routes through extremely busy straits.
- “ Oil and natural gas are shipped over long distances, typically from the politically unstable Middle East and Africa.



Alternative Emergency Response Measures (1)

(These measures were collected based on the responses of the economies or government organizations that participated in the "APEC Oil and Gas Security Exercise")

A1. Oil Emergency Response Measures (Supply Side)

- “ Drawdown Oil Stock (*short-term*);
- “ Utilize Spare Capacity (*short- to medium-term*);
- “ Secure Crude Processing Deals (CPD) (*short- to medium-term*);
- “ Seek Assistance from Other Economies (*short- to medium-term*);
- “ Secure Oil Import (*short- to medium-term*);
- “ Utilize more Biofuels (*medium-to long-term*);
- “ Develop Oil Stockpile (*long-term*).

A2. Oil Emergency Response Measures (Demand Side)

- “ Introduce Car Pooling (*short-term*);
- “ Conduct Oil Rationing (*short- to medium-term*);
- “ Implement Energy Efficiency and Conservation for Power Consumption (Electricity Saving Campaigns) (*short- to medium-term*);
- “ Shift to Alternative Fuel for Power Generation (*medium-to long-term*).



Alternative Emergency Response Measures (2)

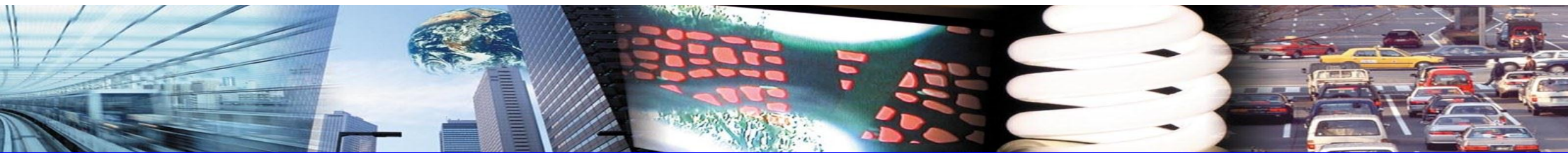
(These measures were collected based on the responses of the economies or government organizations that participated in the "APEC Oil and Gas Security Exercise")

B1. Gas Emergency Response Measures (Supply Side)

- “ Drawdown Liquefied Natural Gas (LNG) from Storage (*short-term*);
- “ Utilize Spare Capacity (*short- to medium-term*);
- “ Seek Assistance from Other Economies (*short- to medium-term*);
- “ Secure LNG Import (*short- to medium-term*);
- “ Develop LNG Storage Tank Facility (*long-term*).

B2. Gas Emergency Response Measures (Demand Side)

- “ Conduct LNG Rationing (*short-term*);
- “ Implement Energy Efficiency and Conservation for Power Consumption (Electricity Saving Campaigns) (*short- to medium-term*);
- “ Shift to Alternative Fuel for Power Generation (*medium-to long-term*).



Conclusions

OIL AND GAS SECURITY EXERCISE MODEL PROCEDURE

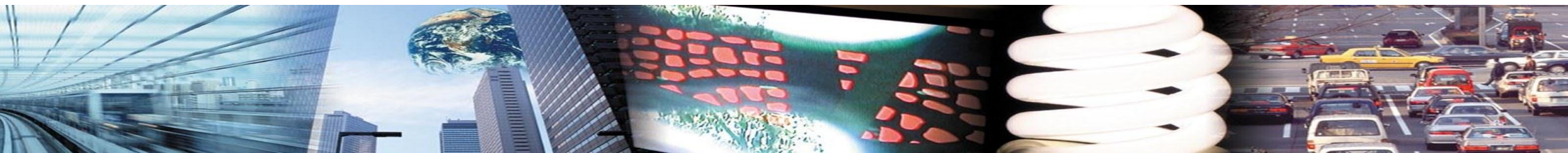
*A Step-by-Step
Approach for
Planning, Conducting
and Evaluating Emergency Exercise*

1st DRAFT

Asia Pacific Energy Research Centre



- “ APEC economies should anticipate the potential threats/hazards that might trigger disruptions of oil/gas supply.
- “ Conducting the exercise in oil/gas is the key in order to improve performance and capacity of system and personnel to be more effective in dealing with oil and gas supply disruptions.
- “ APERC has drafted “OGS-EMP” to promote and guide economies in the implementation of emergency exercise, which is a step-by-step approach on oil and gas emergency exercises.



Thank you for your kind attention

<http://aperc.ieej.or.jp>



An Example of Oil Scenario

(Indonesia Exercise)

Attachment

Background of Emergency Situation

- Cilacap Refinery is located in Cilacap, one district in Central Java Province where this refinery was constructed close to the Indian Ocean.
- Cilacap Refinery consists of 3 (three) complex, namely (1) Fuel Oil Complex (FOC) I, and Lube Oil Complex (LOC) I, (2) Fuel Oil Complex (FOC) II, and Lube Oil Complex (LOC) II, and Lube Oil Complex (LOC) III, and (3) Petrochemical refineries Paraxylene. The total capacity of Cilacap Refinery for processing crude oil is about of 348,000 Barrel per-day (30% of the national capacity). The shares of Cilacap Refinery in the national fuels production are Aytur (49%), Premium (33%), Kerosene (23%), Gas Oil/ADO/HSD (25%), Diesel Oil/IDO/MDF (63%), and Fuel Oil/DCO/IFO/MFO (79%). And also producing LPG (14%).
- Some parts of Cilacap Refinery installations were on fire in 2008, 2009 and 2011.
- The Cilacap Refinery is also threatened by natural disaster such as earthquakes and tsunamis. Although no incidents of damage caused by natural disaster so far.

Source: APERC, 2013



Occurrence of Emergency Situation

- Suddenly an 8-magnitude earthquake strikes Cilacap area and causes damage to Cilacap Refinery. Fuel oil complex I installations are on fire after the earthquake and cause the total loss of the production of fuel products. Though Fuel oil complex II installations can escape from fire, they are also somewhat damaged.
- Based on the results of the inspection, repairing a damaged installation process in Fuel oil complex I is expected to take at least 3 (three) months and that in Fuel oil complex II is at least 2 (two) weeks.