APERC Workshop at EWG 55
Hong Kong, China, 14 May, 2018

2-2. Oil and Gas Security Exercise in Peru

Diego RIVERA RIVOTA
Researcher

APERC
Asia Pacific Energy Research Centre

APEC
Asia-Pacific Economic Cooperation

APEC Oil and Gas Security Exercises (OGSE)

- The APEC Oil and Gas Security Exercise (OGSE) is a response to the 10th APEC Energy Ministers Meeting Declaration in Saint Petersburg, Russia on 24-25 June 2012.
- OGSE is a process in which hypothetical scenarios are prepared simulating an oil and/or gas supply disruption. The supply disruption may be caused by natural disasters, technical failure, political unrest, among other factors.
- The main objectives of OGSE:
  - To study domestic systems (policies, plans, protocols, etc.) for emergency preparedness in each APEC economy.
  - Increase awareness on energy security policies and emergency preparedness.
  - Share best practices among APEC economies.
- APERC has held five exercises:

  1. Joint Southeast Asian Exercise in Bangkok, Thailand in September 2013.
  2. Indonesian Exercise in October 2013.
  3. The Philippines Exercise in December 2015 (first under the Oil and Gas Security Initiative (OGSI)).
  4. Exercise for Regional Capacity Building in Australia with participation of Indonesia, the Philippines and Thailand in March 2017.
  5. Peruvian Exercise in November 2017.

Oil and Gas Security Exercise in Peru

- 3 day exercise in Lima, Peru on November 6-8, 2017.
- Co-organised by APERC and Peru's Ministry of Energy and Mines.
- The Expert Team was composed of 6 specialists on energy security from the APEC region.

- Around 30 Peruvian participants from Ministries, regulators, local governments, private sector and academia.
- The OGSE in Peru was a 'blind' type exercise.
- Realistic approach to emergency scenarios, with limited time and information.
- 2 separate scenarios: oil and gas.

Expert Team

1. ***Ms. Sylvia Larrea***
   Lead Energy Specialist
   Inter-American Development Bank (IADB)

2. ***Ms. Martha Vides Lozano***
   Senior Hydrocarbons Specialist,
   Latin American Energy Organization (OLADE)

3. ***Dr. Phoumin Han***
   Energy Economist
   Economic Research Institute for ASEAN and East Asia (ERIA)

4. ***Mr. John Powell***
   Director, Office of Liquid Fuels Analysis, U.S. Department of Energy

5. ***Mr. Hiroaki Maruyama***
   Project Director,
   Japan Oil, Gas and Metals National Corporation (JOGMEC)

6. ***Mr. Pedro Gamio***
   Professor and Researcher,
   Institute for the Science of Nature, Territory and Renewable Energies (INTE - PUCP)

The first scenario: Oil supply disruption.

Map source: Google Map

- Peru's central coast region, where Lima is located, was hit by an **8.8 magnitude earthquake**. The earthquake was followed by a **tsunami**.
- The La Pampilla refinery, located in the port of Callao, has **completely stopped operations** due to damage caused by both the earthquake and the tsunami.
- With a capacity of 102 000 b/d (half of Peru's total) out of operation, the main impact will be in the central coast region where **around 40% of gasoline and 30% of diesel** demand is produced.
- Distillation Units 1 and 2 were heavily damaged, resulting in a **total loss of production of fuel products and around 50% of stock products**.
- The repair of the damaged **Distillation Units 1 and 2 facilities is expected to take at least 2 months** and **at least 3 weeks for Distillation Unit 3**.

Oil emergency scenario participant's responses

- Importing extraordinary oil products cargoes by ship.
- Using production from the Talara refinery.
- Clearing major highways and roads, as they need to be used to transport oil products from other refineries or terminals.

- Rationing demand and cancelling non-essential activities – such as school and university classes.
- Reviewing basic services first, such as hospitals and food distribution.
- Assessing the damage on the affected refining infrastructure.
- Rationalising demand.
- Using the contingency fund to buy oil products.

The second scenario: Gas supply disruption.

- Strong rains caused a massive landslide, also known as "huaico".
- This landslide **fractured** the **Camisea gas pipeline**, which transports **more than 90% of Peru's natural gas** coming from the Camisea field.
- All natural gas flows are **completely stopped**. The repair team cannot reach the damaged area due to safety concerns as heavy rains are still happening.
- Repairing the pipeline and the normalisation of natural gas flows will take **at least 3 weeks**, depending on the extent of the damage.
- Unavailability of the gas pipelines implications:

1. Around **50% of power generation** capacity off. Even by turning on oil-fueled power plants, blackouts are expected.
2. **Industrial and residential** natural gas users will face, at least partial, shortages of natural gas.
3. All **LNG export** cargoes will be suspended.

Gas emergency scenario participant's responses

- The government should clarify in detail the infrastructure that was damaged during the disaster.
- Assuring there were no other fractures or leaks in the pipeline.
- Maximising hydropower generation.
- Dispatching as much as possible power plants fuelled by oil and coal.
- Importing as much electricity as possible from Ecuador.
- Rationalising power demand with the exception of vital facilities.
- Suspending all LNG export cargoes.
- Using gas available in the LNG exports plant facility.
- Maximising the use of LPG as a substitute fuel.

Expert Review Team recommendations

- Peru should carefully redesign its emergency management organisation, particularly involving disruptions in oil and gas supply.
- Setting up a task force for energy emergency situations.
- Clear roles for organisations in the event of an emergency have to be developed for emergency measures such as:
  - internal information flows,
  - communicating with the public,
  - analysing data and the extent of damage,
  - mandating restrictive policies,
  - soliciting international support,
  - providing overall coordination of emergency relief efforts.

- Setting up an organisation responsible for monitoring and holding oil products emergency stocks.
- Including energy security and preparedness in Peru's next energy plan.
- Future regulatory framework should be able to cover emergency supply.

Expert Review Team recommendations

- Establishing a robust database with detailed information on electricity and hydrocarbons supply:
  - power generation installed capacity, reserve margin, main supply routes,
  - energy demand estimates of essential services,
  - oil product stocks levels,
  - crude oil and product import volumes,
  - production per refinery, sales, and pipelines, ports and land tankers capacity.
- Assessing demand elasticity and the economic and financial costs of an emergency.
- Recommencing the construction of the *Gasoducto Sur Peruano* gas pipeline.
- Diversifying power generation sources to reduce gas dependency, especially by promoting renewable sources.
- Conducting a thorough analysis for building a Floating Storage and Regasification Unit (FSRU) to import gas during emergencies and in the medium term.
- Strengthening energy efficiency policies.
- Developing an international cooperation framework to import fuels during emergencies.

Conclusion

- Despite the existence of an Energy Security Law and the relatively high vulnerability of some fields of the Peruvian energy sector, an **energy security** framework and policies need to be further strengthened in Peru's planning.
- Participants emphasised that Peru has been focusing on supply security, mainly, if not exclusively, by infrastructure development.
- Peru relies heavily on crude oil and product imports. Most of their **infrastructure concentrated in coastal** areas is vulnerable to earthquakes, and floods.
- More than 95% of natural gas production comes from the **Camisea** field.
- Almost all of this gas is transported by a **single pipeline** and is used to generate **45% of Peru's electricity** and **60% of LPG production**.
- The Peruvian oil and gas sectors are **severely exposed** to supply disruptions, especially natural disasters.
- The exercise exposed that Peruvian authorities did **not** have a **clear responsibility distribution** during an emergency scenario.
- While disaster preparedness plans and actions involve considerable **investments** and challenges for Peru, recovery and emergency losses **without preparedness** are not only greater but could also be catastrophic.

Thank you for you attention.

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