



INDUSTRY SENSOR GRID FEASIBILITY STUDY



SCOPE

- Background (Recap)
- Feasibility Study Update
- Moving Forward

BACKGROUND (RECAP)

SCDF FIRE DECAM

DE-CENTRALISED ALARM MONITORING SYSTEM

SCDF
OPS CENTRE



DECAM
OPERATOR



- Fire Detectors
- Fire Alarm Devices
- Manual Call Points
- Automatic Fire Protection Equipment

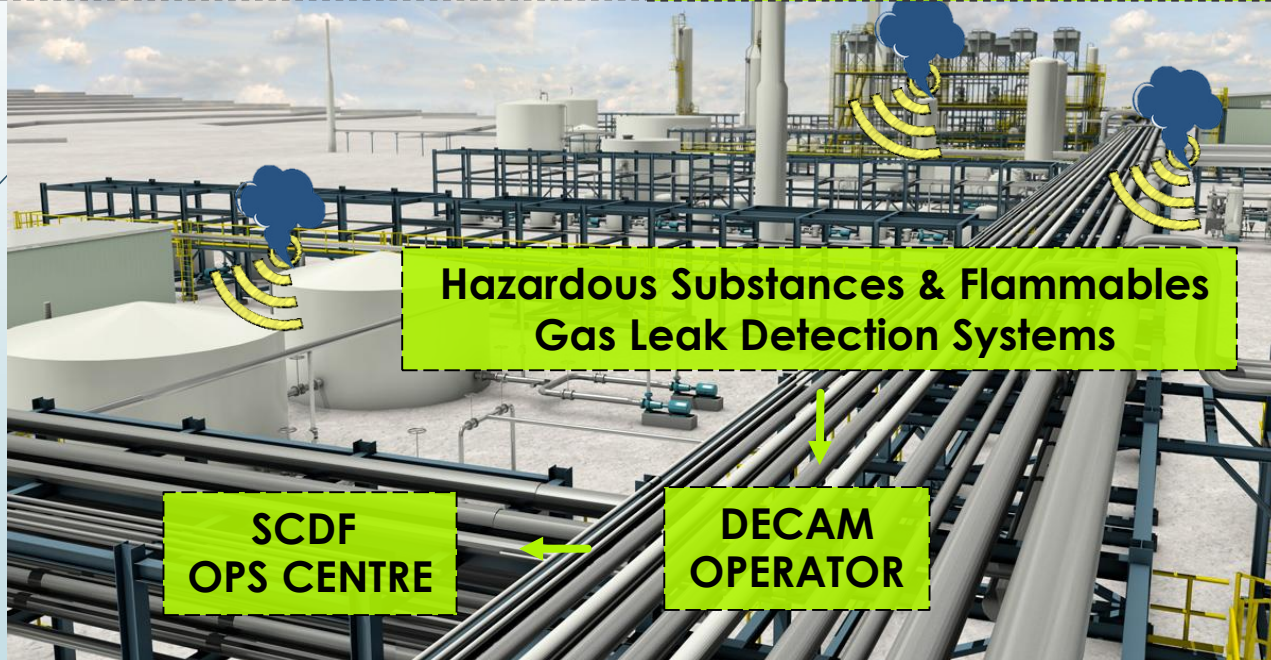


BACKGROUND (RECAP)

SCDF FIRE DECAM

DE-CENTRALISED ALARM MONITORING SYSTEM

**GAS LEAK
MONITORING SYSTEM**



**Hazardous Substances & Flammables
Gas Leak Detection Systems**

**SCDF
OPS CENTRE**

**DECAM
OPERATOR**

BACKGROUND (RECAP)

GAS LEAK MONITORING SYSTEM

» **Current Practice**

- Companies call 995 to report gas leak incidents

» **Challenges Faced**

- Underestimation of gas leak resulting in delayed reporting of incident by affected company
- Affected company may be overwhelmed by incident
- Company may be unaware of offsite impact
- Gas leak may escalate quickly to a fire

BACKGROUND (RECAP)

SCDF FIRE DECAM
DE-CENTRALISED ALARM MONITORING SYSTEM

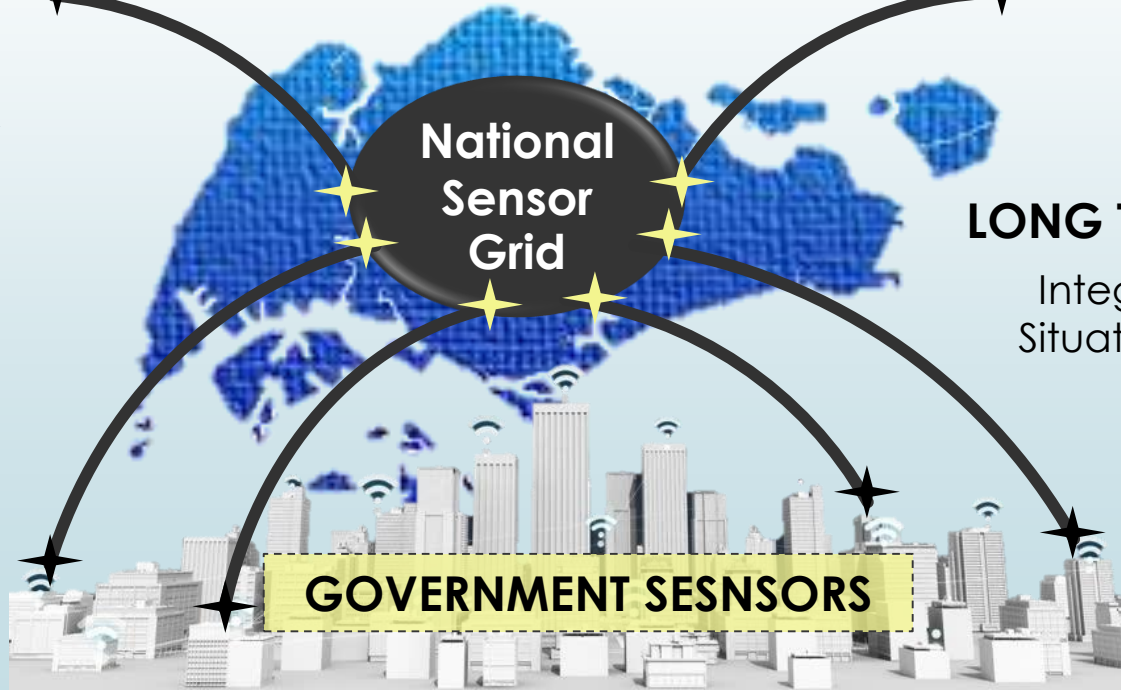
**GAS LEAK
MONITORING SYSTEM**

**National
Sensor
Grid**

LONG TERM OBJECTIVE

Integrated National
Situational Awareness

GOVERNMENT SENSORS



BACKGROUND (RECAP)

FEASIBILITY STUDY

» Agencies Involved

SCDF, NEA, MOM

» Technical Consultant

DSO National Laboratories

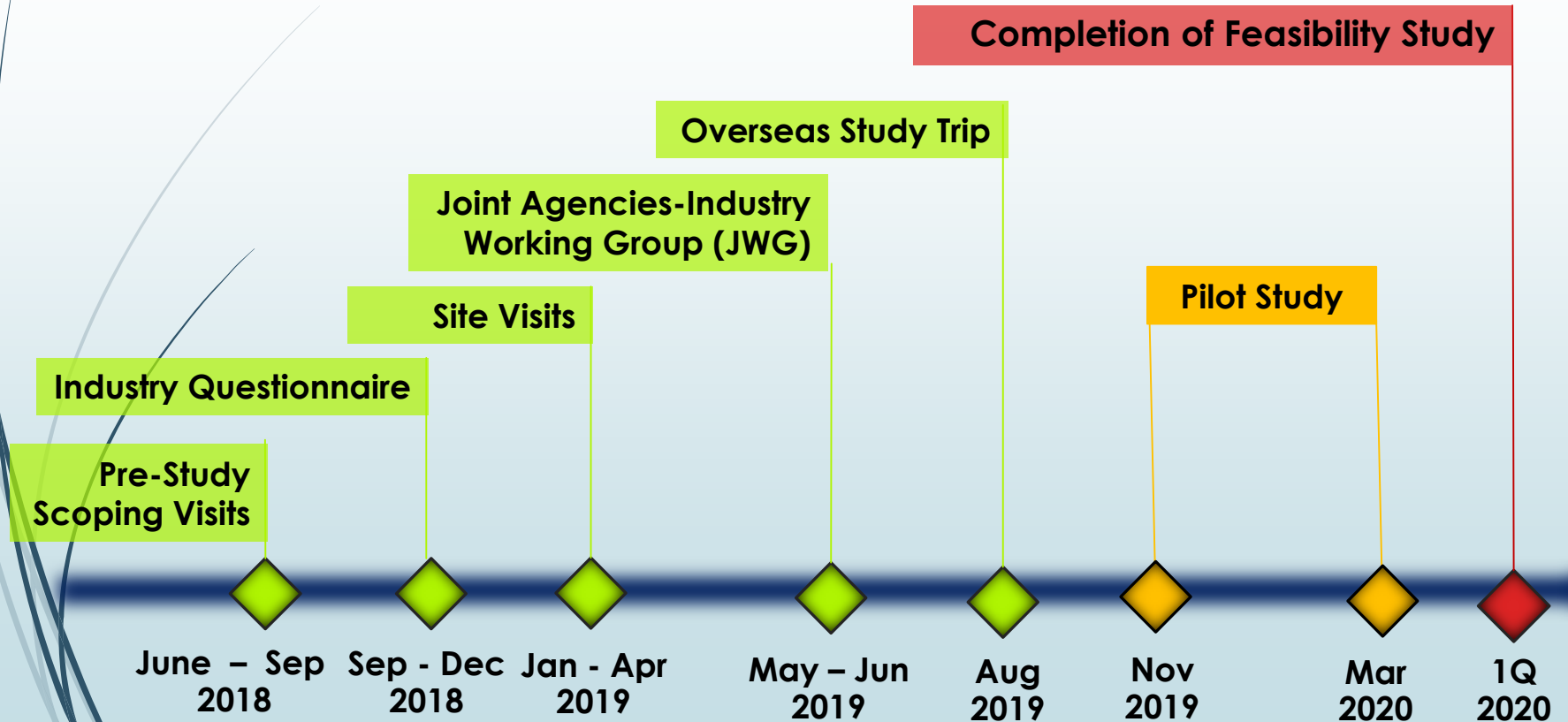
» Duration

3Q 2018 – 1Q 2020

» Key Deliverables

Identifying practical technical solutions, cybersecurity implications, implementation cost, etc.

FEASIBILITY STUDY UPDATE



FEASIBILITY STUDY UPDATE – SITE VISITS

>> BROAD CATEGORIES OF DETECTION SYSTEM SETUP

1	Detectors integrated to 1 Large ICS / A few sub-ICS
2	Detectors integrated to 1 Small ICS / Fire Alarm Panel
3	Detectors not integrated to ICS
4	No gas detectors

- Lack of uniformity due to varying considerations by individual Company's operating environment
- Direct linking of existing in-situ detection systems would result in varying cost & resources' requirement for each Company

FEASIBILITY STUDY UPDATE – JWG

» JOINT AGENCIES-INDUSTRY WORKING GROUP

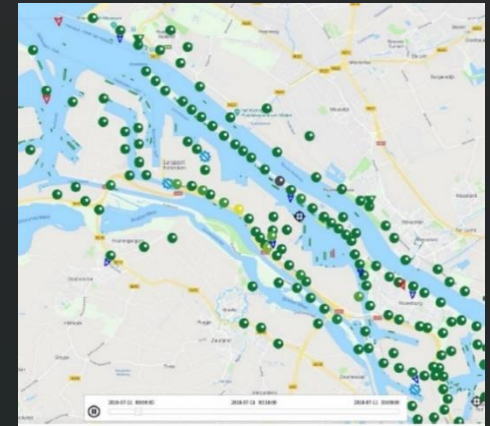
- **Members:** SCDF, MOM, NEA, DSO + SCIC Member Companies
- **Aim:** Formulate list of practical and cost-effective technical solutions

1	Link up to <u>existing</u> TIC gas detection system
2	Separate <u>standalone</u> point TIC gas detection system at source inside facility
3	Separate <u>perimeter</u> TIC gas detection system <u>inside</u> facility
4	Separate <u>perimeter</u> TIC gas detection system <u>outside</u> facility (i.e. public sensors)
5	Combination of the above

FEASIBILITY STUDY UPDATE – STUDY TRIP

» OVERSEAS STUDY TRIP TO PORT OF ROTTERDAM, NETHERLANDS

- **Agencies Involved:** SCDF & DSO
 - **Aim:** Observe the adoption of a similar sensor grid (e-Nose Network)
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- Electric Nose (e-Nose) Sensor Network:
 - detect emission of unpleasant/dangerous gases
 - triangulate the suspected origin of release
 - 250 Public e-Noses (Government-owned) & 150 Private e-Noses (Industry-owned) within an area of 100km²



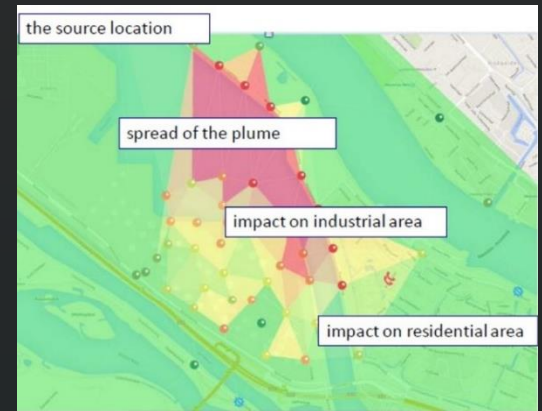
FEASIBILITY STUDY UPDATE – STUDY TRIP

» OVERSEAS STUDY TRIP TO PORT OF ROTTERDAM, NETHERLANDS

- **Agencies Involved:** SCDF & DSO
- **Aim:** Observe the adoption of a similar sensor grid (e-Nose Network)

• **Benefits:**

- Relatively lower cost of implementation
- Scalable (Island-wide deployment)
- Ability to track plume & triangulate to source
- Ability to set uniform threshold levels for monitoring



FEASIBILITY STUDY UPDATE – PILOT STUDY

» **Key Objectives**

- Assess impact of direct link-up of existing detection systems vs standalone detection systems
- Monitor rate of potential false alarms
- Assess workflow involving SCDF, Company & DECAM Operator

» **Pilot Study Details**

- 3 companies have been selected on a voluntary basis
- Nov 2019 to March 2020

MOVING FORWARD

» Conclusion of Industrial Sensor Grid Feasibility Study

» E-Nose Pilot Study

- **Aim:** Evaluate the functionality of e-Noses in Singapore's operating environment, for potential adoption in the Industry Sensor Grid
- **Trial Period:** 3Q 2020

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- » Agencies will assess the findings for subsequent policy review and implementation
 - » Further Industry engagement sessions to be scheduled to facilitate sharing of findings & to solicit feedback

THANK YOU



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The Life Saving Force

