

Translating Locally-led Resilience into Action
in the Age of Complex Risk and Digital Transformation
복합위험과 디지털 전환시대, 지역주도 복원력의 실행

The 5th



International Disaster Resilience
Leaders Forum **Incheon 2026**

인천 국제재난복원력 지도자 포럼



2026. 9. 7.(월) - 9. 8.(화)
September 7-8, 2026



송도컨벤시아 그랜드볼룸 A
Songdo Covensia, Grand Ballroom A

SCDF's AI Journey

Asst Comr Dennis Quah

Singapore Civil Defence Force



SCDF

The Life Saving Force

... for a safer Singapore

Scope

1



Singapore and SCDF

2



AI as a Force Multiplier

3



SCDF's AI Use Cases

4



Responsible & Effective AI

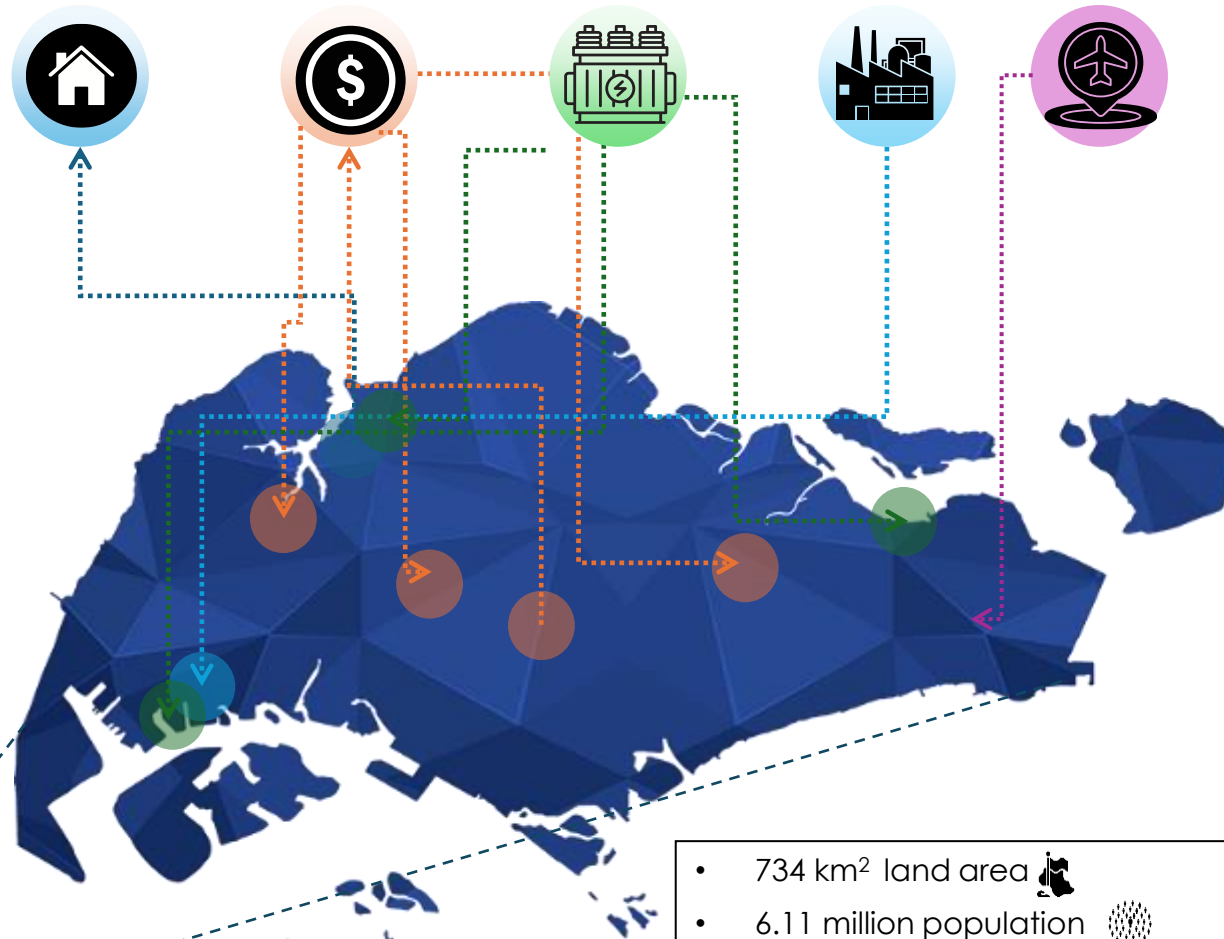
5



Regional & International Cooperation



Singapore's Profile



- 734 km² land area 🏠
- 6.11 million population 🌐
- Population density of 8,325 per sq km
- Aging population 1:4 (in 2030)



High-rise Residential



Central Business District & Satellite Business Districts



Energy Storage System (ESS) Facilities



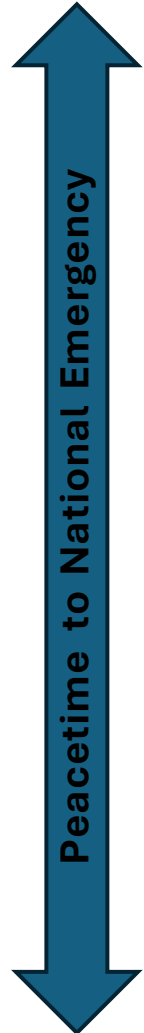
Industrial & Petroleum Industries



Transport Hub (Shipping & Aero)



Singapore Civil Defence Force



**Firefighting &
Rescue**



**Hazardous
Materials**



**Emergency Medical
Services**



**Fire Safety &
Public Protection**



**Community
Engagement**

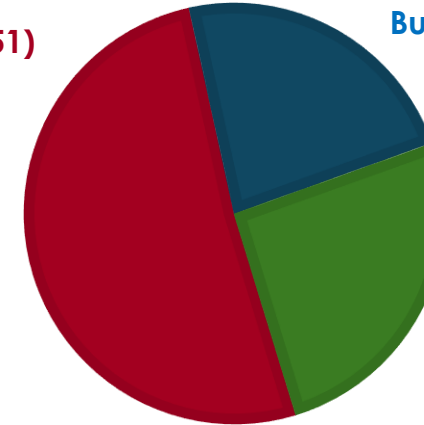
Fire and EMS Calls 2025

Breakdown of Fire Calls (2,050 Calls)

Residential
Buildings (1051)
51.3%

Non-residential
Buildings (471)
23%

Non-building
Premises (528)
25.7%

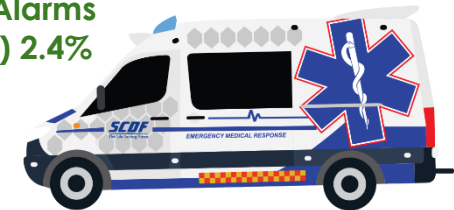
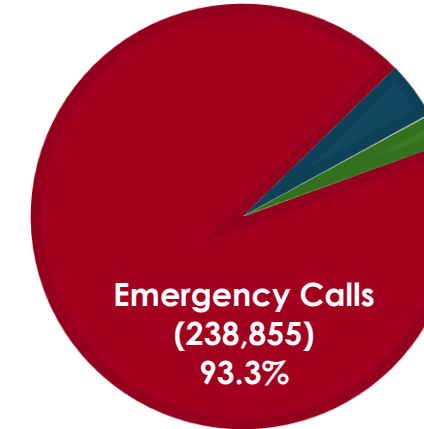


Breakdown of EMS Calls (257,158 Calls)

Emergency Calls
(238,855)
93.3%

Non-Emergency Calls
(11,064) 4.3%

False Alarms
(6,239) 2.4%



AI as a Force Multiplier in Firefighting & Rescue



Enhanced Decisions

Real-time intelligence supports critical operational decisions

Faster Response

Accelerated processing reduces emergency response times

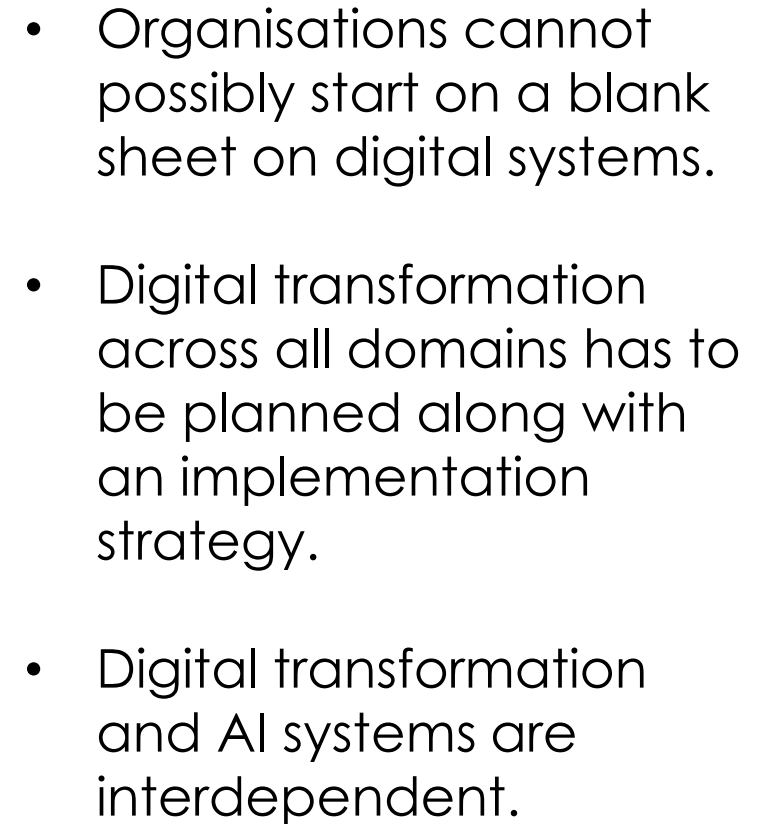
Better Outcomes

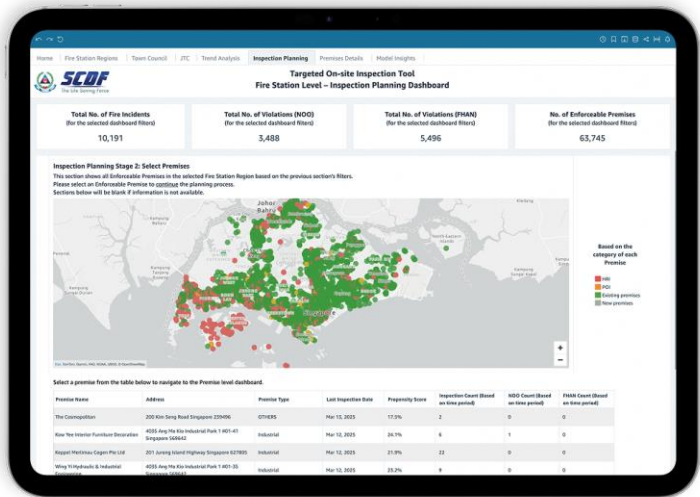
Enhance operational outcomes with sharper and timely interventions

People are at the heart of the emergency services. AI is being introduced as a copilot/assistant to enhance decisions, enrich perspectives and ultimately improve mission outcomes.

Looking ahead, we ought to ask – how does AI make what we do necessary at all?

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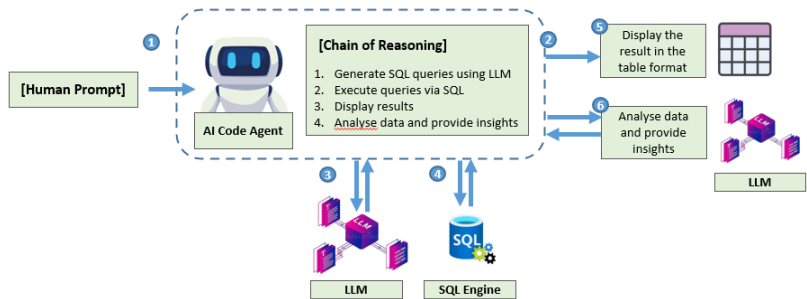


Risk Propensity Scoring

Machine learning scores each premises for fire risk from building type, occupancy profile and violation history, so inspections go where risk is genuinely highest.

Fire Safety Copilot

Officers ask questions in plain language and receive context-specific answers, replacing static dashboards with actionable insight, automated scheduling and on-the-go digital reporting.



BVLOS Drone Inspections

Drones inspect building facades, rooftop equipment and external fire safety features, extending enforcement reach without officers needing to be on site.





Protecting Responders from Collapse

TILDE (Tilt Detect) is an in-house structural monitoring solution built to safeguard responders on the ground.



Real-Time Structural Monitoring

A small IoT sensor placed directly on the structure uses computer vision to detect motion in real time, catching dangerous movement the human eye cannot.



Precise Tilt Sensing

A built-in inertial measurement unit flags tilt beyond a set angle at around 1.5° of precision, with approximately 11 hours of battery life.



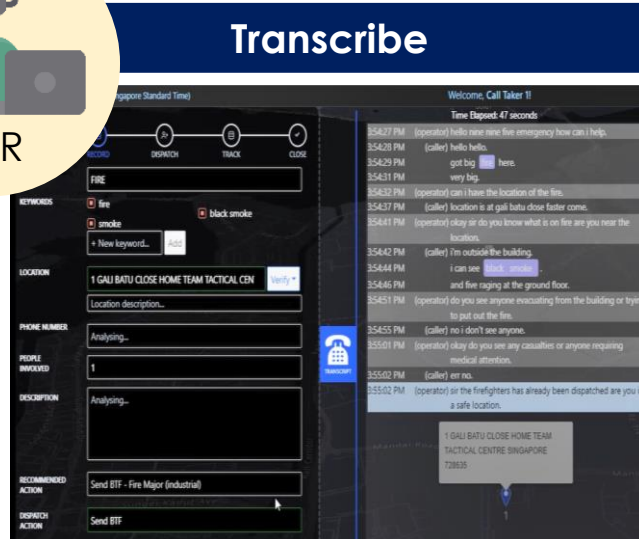
Instant Evacuation Alert

When dangerous movement is detected, an alert is broadcast to all responder devices nearby. The devices vibrate and sound off the triggering sensor's name, sending a clear evacuation warning even in noisy, smoke-filled conditions.

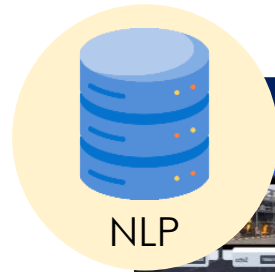
Automated Speech Recognition



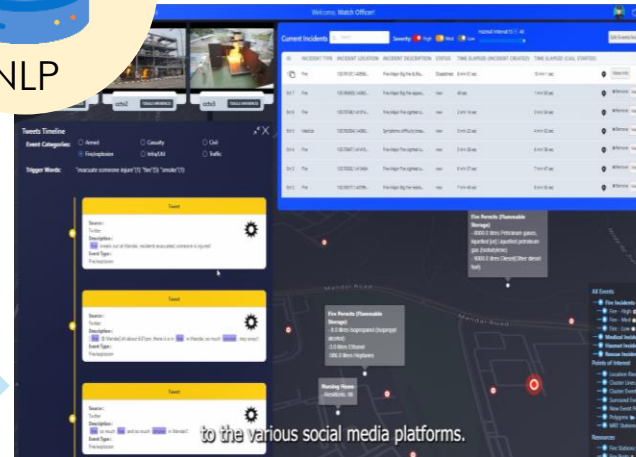
Transcribe



- Transcribe in real-time emergency calls in English, Mandarin and Malay
- Recognise “Singlish” – colloquial form of English in Singapore



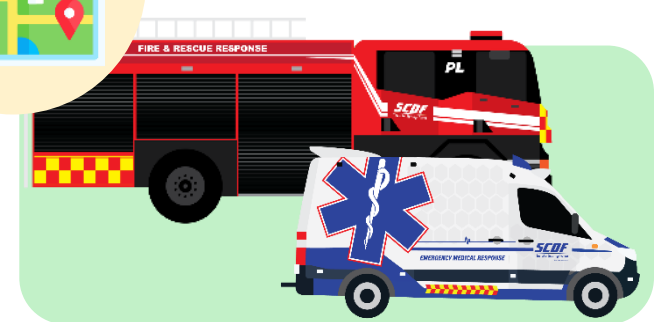
Extract Details



- Address and incident details detected and automatically filled in incident forms



Enhance Dispatch



- Frees up the call taker from manual recording to focus on querying incident to expedite triaging
- Improved dispatch efficiency and accuracy, and higher quality of caller engagement

Augmented Reality (AR) Smart Goggles



Hands-Free Operation

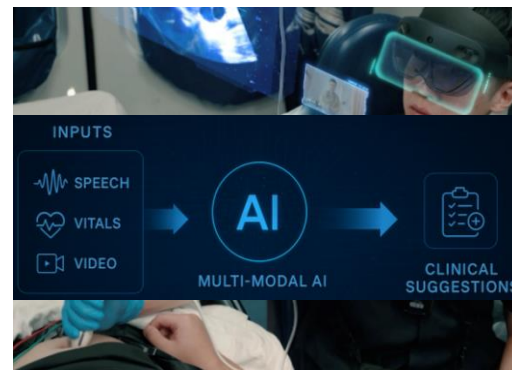
Eye tracking and voice-activated commands keep responders' hands on the patient.

Clinical Decision Support

AI-powered vital sign analysis, real-time triage support and early alert generation through a multi-modal copilot module.

Extended Clinical Skills

Ultrasound guidance, infrared vein finding, telemedicine annotation and procedure overlay.



Eye Tracking Heads-up Display
Hands free commands



'Infrared Sensors' Vein Finder
with AI guidance

Robotics and UAV - Our Vision

TODAY

UAV for Enhanced
Situational
Awareness



Unmanned Ground Robotics
(Firefighting)
3R, PFM, H3M and UFM 3.0



AED UAV
Delivery of AEDs to CFR

Drones as
First Responders



Unmanned Ground
Vehicle (UGV) for
HazMat Detection

UGV for EV Extrication

VISION TOWARDS 2030



Beyond Visual Line of Sight
(BVLOS UAVs)

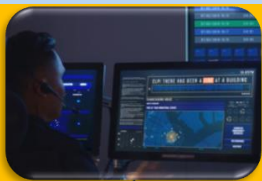
Tier 1



Tier 2



Integrated
Swarm
Robotics
Capabilities



Remotely Operated
Vehicle for Underwater
Search and Rescue



Unmanned Surface Vessel for
Early Marine Incident
Response



Key Enablers for Responsible and Effective AI

Building these capabilities takes more than technology, and enablers must be in place.



Data Quality & Interoperability

- Good data infrastructure
- Clear implementation strategy across all domains



Governance & Human Oversight

- All systems operated under human supervisory control



Workforce Readiness

- AI literacy becomes a core competency
- AI embedded into daily working life of officers

Regional and International Cooperation



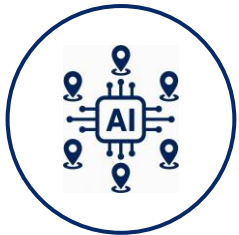
Coordination Across Borders

Haze, pandemics and infrastructure failures do not have borders, demanding that nations share information, coordinate resources and operate together.



Shared Foundations

Common data standards, openly shared lessons on what works and what fails, and compatible ethical frameworks let AI systems exchange meaning across nations.



Region-Fit AI Models

Cooperating on training data, model development and validation across our languages, hazards and building types.

Thank you

AC Dennis Quah

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