



EMERGENCY WARNING SERVICES via GNSS



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Global trend to develop Disaster Risk Reduction technologies:

- United Nations' Sendai Framework for Disaster Risk Reduction: *“Substantially increase the availability of and access to **multi-hazard early warning systems** and disaster risk information and assessments to people by 2030”*
- World Meteorological Organization – 2020 State of Climate Services report (13 October 2020), confirms the importance of **early warning systems** for disaster prevention and risk reduction



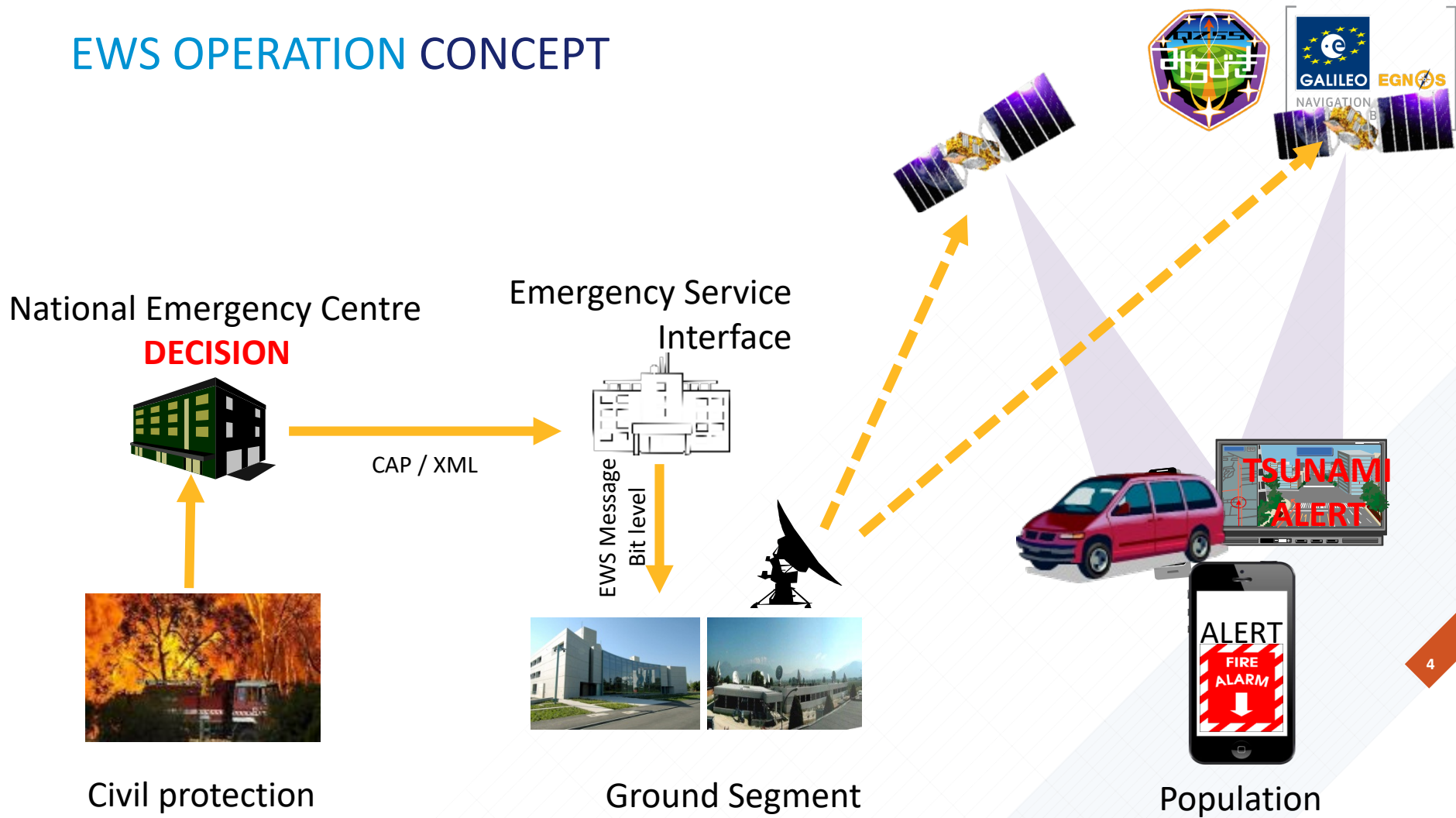
SATELLITE-BASED EWS CONCEPT



- Purpose: **Alert the population** in case of a looming disaster (fire, storm, floods, tsunamis, volcano, industrial...) and **provide guidance**.
- **Complementary alert system** to those already operated at national level: Civil Protection entities *decide to trigger* the alert and *contact the GNSS provider* to broadcast a message.
- **No 'mobile' coverage required**: the service is available when nothing else remains : e.g. destruction of mobile networks.
- **No specific user equipment required**: People receive the alert message on their mobile phone, smartwatch or handheld device when located in the alert area.



EWS OPERATION CONCEPT



The service is realised by three components:

Civil Protection Authorities

Infrastructure

end users

EU AND JAPAN ACTIVITIES FOR EMERGENCY WARNING SERVICES VIA GNSS MESSAGES



In the last couple of years, EU and Japan have together:

- ★ **Defined** a common ‘EWS message format’
- ★ **Organized** and executed a demonstration using QZSS satellites.
- ★ **Presented** status and progress at ICG in Xi’an China, and created an EWS correspondence group with all GNSS providers + Australia.

Since 2020:

- ★ **EU and Japan interacted regularly** to produce a stable version of the common message format. Cooperation between DG DEFIS and CAO NSPS + AIIT (Advanced Institute of Industrial Technology).
- ★ **Joint EU-Japan statement provided** at ICG-15 Working Group-B (Sept. 2021)
- ★ **On-going tri-partite discussions** with India, who is willing to join the activity to utilize the common EWS message.
- ★ **Japan run real test cases using QZSS** (Summer 2021).

Next steps:

- ★ **EU to run EWS demonstrations** using Galileo (2022).
- ★ **Publish** a joint EWS Interface Control Document, to become the standard for Emergency Warning message broadcasting through GNSS satellites

15th ICG: International Committee on GNSS

- Date : 2021 Sep.27th-Oct1st
- Venue : Vienna , Austria @ Vienna International Centre
- Participants : 320, 14 states , 25 organizations
- Mission [<https://www.unoosa.org/oosa/sk/ourwork/icg/icg.html>]

Established in 2005 under the umbrella of the United Nations, promotes voluntary cooperation on matters of mutual interest related to civil satellite-based positioning, navigation, timing, and value-added services.

Among the core missions of the ICG are to encourage coordination among providers of global navigation satellite systems (GNSS), regional systems, and augmentations in order to ensure greater compatibility, interoperability, and transparency, and to promote the introduction and utilization of these services and their future enhancements, including in developing countries, through assistance, if necessary, with the integration into their infrastructures.

- Main topic of the 15th meeting
 - GNSS System Provider Updates
 - Interoperability and Service Provision, Compatibility and Spectrum
 - Enhancement of GNSS Performance, New Services and Capabilities
 - **India announced that will join to utilize common EWS message format.**
 - Information dissemination and capacity building
 - Reference Frames, Timing and Applications
- Next Step
 - 16th ICG 2022 in UAE
 - CO chair of Providers meeting
 - 2022 : EC & Russia , 2023 : Russia & USA 2024 : USA & Japan





Thank you

EWS MESSAGE FORMAT



Message Type 2 bits	Issuing entity 14 bits	Ref 4 bits	Hazard type 7 bits	Hazard Characteristics 20 bits	Type of Instr. Library (EU or nat.) 1 bit	Instruction library 8 bits	Target area 46 bits	Specific settings 17 bits
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Data fields 119 bits

Alert


Message Type (Alert/Update/Test/Cancel)
Country ID
Sender ID
Message ID

Info

Category (MET, GEO, SAFE, CBRNE, ..)
Type (tsunami, fire, flood, ...)
Severity (m, M, S, X)
Onset (D/H/m)
Duration
Instruction
Position of hazard
Detailed info on hazard (Richter scale, wave height, radiation level, etc)

Area

Center (Lat/lon)
Semi-major Axis (m)
Semi-minor axis (m)
Azimuth (°)
Secondary ellipse definition

IF  is within **Area**,
THEN display **Alert** and **Info**



EWS LIST OF HAZARDS



GEO: earthquake, tsunami, avalanche, lava flow, ash fall, tidal wave, solar storm, etc

MET: cyclone, storm, flood, lightning, snow fall, hail, rain, heat wave, fog, icebergs, etc

SAFETY/SECURITY: shooting, guerrilla, UFO, hijack, abduction, bomb discovery, etc

RESCUE/FIRE: first fire, fire gases, factory incident, mine hazard, etc

HEALTH: plague, pest, UV, air pollution, acid rain, marine pollution, food safety, etc

TRANSPORT/INFRASTRUCTURE: oil spill, bridge collapse, train accident, etc

CBRNE: explosive, attack, meteorite, etc