



Radiological SIGMET

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Overview

- Background
- Recent METP & WG-MISD activities
- Changes to Annex 3 for Amendment 79

Background

- Chernobyl Nuclear Power Plant accident
 - ✦ IFALPA and ICAO agreed to address
- Amendment 74 to Annex 3
 - ✦ Enabled Radioactive Cloud (RDOACT CLD) as SIGMET phenomena
 - ✦ Doc 9691 Guidance
 - ✦ “Temporary” fix
- ICAO Airways Volcano Watch Operations Group
 - ✦ Further consideration & refinement
 - ✦ Little accomplished until Fukushima

Background

- 2014 Met Divisional Meeting
 - ✦ Established MET Panel
 - ✦ Created ICAO Job Card for Radiological SIGMET
 - Improved guidance and procedures for issuing Radiological SIGMET needed
 - Identified two phases of improvement
 - ✦ Phase 1
 - » Allowing a “Cylindrical” SIGMET & improved guidance (near term)
 - ✦ Phase 2
 - » Move from “product” centric (i.e. SIGMET/text) concept to “information” centric
 - » Enable dispersion modeling and radiation concentration forecasts



Background

- Radioactive clouds are different from any meteorological phenomena observed and forecast by meteorological offices and Meteorological Watch Offices (MWO)
 - ✦ MWOs are not experts on radioactive clouds
 - ✦ Yet, MWOs are expected to issue SIGMET information messages on this hazard on a 4-dimensional scale for their respective Flight Information Regions (FIR)
- Challenges with the location of radioactive clouds:
 - ✦ Radioactive clouds are not visible
 - Radioactive clouds cannot be seen or reported by an aerodrome observer in the aerodrome meteorological report (in meteorological code form – METAR/SPECI)
 - Cannot be detected by pilots or crew
 - ✦ Radioactive clouds cannot be detected remotely
 - By radar
 - By meteorological satellites.



Cylindrical SIGMET

Up to 30km diameter

- Surface to Troposphere
- Up to 30km (16nm) diameter



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Images not to scale

Why Up To 30km?

- IAEA Response Actions
 - ✦ IAEA approach to protect the public on the ground during a nuclear or radiological emergency does not include the use of projection tools during the early response
 - ✦ Based on IAEA health hazard considerations for those living on the ground up to 30km from release is most conservative
 - For an airplane in flight, the expected dose would only be a fraction of the dose expected for those living on the ground
 - ✦ Despite this, very conservative approach followed for in flight

Cylindrical SIGMET

- METP WG-MISD
 - ✦ Considered recommendations for developing Phase 2 at July, 2017 and May, 2018 meetings
 - ✦ Decided updating the initial release cylindrical SIGMET with a polygon SIGMET based on dispersion models and concentration information not feasible
 - The current state of the science, and observation capabilities do not support the needs of Aviation users in flight at this time

Cylindrical SIGMET

- Dose and plume projection tools are not considered suitable to determine the issuance of a SIGMET
 - ✦ Past nuclear and radiological emergencies there has not been sufficiently detailed information available to reliably predict transport and deposition of radioactive material
 - ✦ All directions around the source are expected to be potentially affected (making a detailed projection unnecessary)
 - ✦ Additional level of coordination and use of resources is considered unjustified based on past experience



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Current Status of Development

- WG-MISD decisions from 2017 and May, 2018 meetings will go to METP/4 for endorsement
 - ✦ Changes for Amendment 79 Annex 3 for Cylindrical SIGMET
 - ✦ Cease further work on Phase 2 until the state of the science has improved sufficiently
 - Will update the Radiological SIGMET ConOps and Roadmaps by the 2019 WG-MISD meeting
 - ✦ Will hibernate the Radiological work stream

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