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with support from

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How well has the STCE handled the ICAO opportunity so far?



Stuff to be happy



Stuff to improve

What is ICAO?



The United Nations System

UN Principal Organs

- General Assembly
- Security Council
- Economic and Social Council
- Secretariat
- International Court of Justice
- Trusteeship Council⁵

Subsidiary Bodies
Main and other sessional committees
Disarmament Commission
Human Rights Council
International Law Commission
Standing committees and ad hoc bodies

Subsidiary Bodies
Counter-terrorism committees
International Criminal Tribunal for Rwanda (ICTR)
International Criminal Tribunal for the former Yugoslavia (ICTY)
Military Staff Commission
Peacekeeping and political
Sanctions committees
Standing committees and ad hoc bodies

Functional Commissions

Crime Prevention and Criminal Justice	Region
Narcotic Drugs	ECA Economic Commission for Africa
Population and Development	ECE Economic Commission for Europe
Science and Technology for Development	ECLAC Economic Commission for Latin America and the Caribbean
Social Development	ESCAP Economic and Social Commission for Asia and the Pacific
Statistics	ESCWA Economic Commission for Western Asia
Status of Women	
Sustainable Development	
United Nations Forum on Forests	

Departments and Offices

EOSG Executive Office of the Secretary-General	DM Department of Management
DESA Department of Economic and Social Affairs	DPA Department of Public Administration
DFS Department of Field Support	DPI Department of Political Affairs
DGACM Department for General Assembly and Conference Management	DPKO Department of Peacekeeping Operations
	DSS Department of Safety and Security
	OCHA Office for the Coordination of Humanitarian Affairs

Programmes and Funds

- UNCTAD** United Nations Conference on Trade and Development
 - ITC** International Trade Centre (UNCTAD/WTO)
- UNDP** United Nations Development Programme
 - UNCDF** United Nations Capital Development Fund
 - UNV** United Nations Volunteers
- UNEP** United Nations Environment Programme
- UNFPA** United Nations Population Fund

- UN-HABITAT** United Nations Human Settlements Programme
- UNHCR** Office of the United Nations High Commissioner for Refugees
- UNICEF** United Nations Children's Fund
- UNODC** United Nations Office on Drugs and Crime
- UNRWA¹** United Nations Relief and Works Agency for Palestine Refugees in the Near East
- UN-Women** United Nations Entity for Gender Equality and the Empowerment of Women
- WFP** World Food Programme
- UNITAR** United Nations Institute for Training and Research
- UNRISD** United Nations Research Institute for Social Development
- UNSSC** United Nations System Staff College
- UNU** United Nations University
- Other Entities**
 - UNAIDS** Joint United Nations Programme on HIV/AIDS
 - UNISDR** United Nations International Strategy for Disaster Reduction
 - UNOPS** United Nations Office for Project Services

Specialized Agencies⁴

- ILO** International Labour Organization
- FAO** Food and Agriculture Organization of the United Nations
- UNESCO** United Nations Educational, Scientific and Cultural Organization
- WHO** World Health Organization
- World Bank Group**
 - IBRD** International Bank for Reconstruction and Development
 - IDA** International Development Association
 - IFC** International Finance Corporation
 - MIGA** Multilateral Investment Guarantee Agency
 - ICSID** International Centre for Settlement of Investment Disputes
- IMF** International Monetary Fund
- ICAO** International Civil Aviation Organization
- IMO** International Maritime Organization
- ITU** International Telecommunication Union
- UPU** Universal Postal Union
- WMO** World Meteorological Organization
- WIPO** World Intellectual Property Organization
- IFAD** International Fund for Agricultural Development
- UNIDO** United Nations Industrial Development Organization
- UNWTO** World Tourism Organization

NOTES:

¹ UNRWA and UNIDIR report only to the General Assembly.
² IAEA reports to the Security Council and the General Assembly.
³ WTO has no reporting obligation to the General Assembly (GA) but contributes on an ad-hoc basis to GA and ECOSOC work inter alia on finance and developmental issues.
⁴ Specialized agencies are autonomous organizations working with the UN and each other through the coordinating machinery of ECOSOC at the intergovernmental level, and through the Chief Executives Board for Coordination (CEB) at the inter-secretariat level. This section is listed in order of establishment of these organizations as specialized agencies of the United Nations.
⁵ The Trusteeship Council suspended operation on 1 November 1994 with the independence of Palau, the last remaining United Nations Trust Territory, on 1 October 1994.



radiation at flight altitude



HF communication disturbances



GNSS positional errors



International Civil Aviation Organisation

SWX ADVISORY		
DTG:	20170818/020304Z	<i>time of generation</i>
SWXC:	PECASUS	<i>space weather center</i>
ADVISORY NR:	2017/314	<i>sequence nr</i>
SWX EFFECT	HF COM SEV	<i>impact MOD or SEV</i>
OBS SWX	20170818/015520Z	<i>observed time of flare</i>
	DAYLIGHT SIDE	<i>affected area</i>
FCST SWX +6HR:	NO SWX EXP	<i>forecast</i>
FCST SWX +12HR:	NO SWX EXP	<i>forecast</i>
FCST SWX +18HR:	NO SWX EXP	<i>forecast</i>
FCST SWX +24HR:	NO SWX EXP	<i>forecast</i>
RMK:	Solar flare occurred. Complete HF (high frequency) radio blackout on the entire sunlit side of the Earth lasting for a number of hours. This results in no HF radio contact with mariners and en route aviators in this sector.	
NXT ADVISORY:	NO FURTHER ADVISORIES	



International
Civil Aviation
Organization

Organisation
de l'aviation civile
internationale

Organización
de Aviación Civil
Internacional

Международная
организация
гражданской
авиации

منظمة الطيران
المدني الدولي

国际民用
航空组织

Tel.: +1 514-954-8219 ext. 6717

Ref.: AN 10/1-IND/17/11

9 June 2017

Subject: Request for interest in providing a space weather information service

Action required: Comments to reach Montréal by 8 September 2017

Sir/Madam,

3. To assist ICAO in the designation of space weather information providers, the World Meteorological Organization (WMO) has been invited to assess each potential candidate State through site visits and audits. It is important to note that each potential candidate State must cover the expenses related to the site visits and audits.

4. It is also important to note that the Air Navigation Commission highlighted the need for a Provider State and its associated space weather centre(s) (SWXC) to arrange for the provision of a contingency service to ensure the continuity of service in the event of a service interruption. In this regard, a space weather information provider in one State with one SWXC could designate its backup centre within its own political boundaries, or in another State. Backup centres must also be audited and the expenses related to the site visits and audits must also be covered by the potential candidate State.

5. It should also be noted that the Guidance on Criteria for Space Weather Information Providers (see attachment), and consequentially applications to be considered as a service provider, may be met by a single entity or a consortium of multiple space weather information providers with appropriate arrangements for coordination and harmonization.

6. May I request that, if your State is interested in providing a space weather information service (as described in SL AN 10/1-17/41, Attachment B, Initial Proposal 1) in any of the ways described in paragraph 5, a formal expression of interest be dispatched to reach me at your earliest convenience and, in any case, not later than **8 September 2017**. The Air Navigation Commission has asked me to specifically indicate that, in view of the established timeline for the process outlined in the Schedule for Establishing Space Weather Information Capability (see attachment), expressions of interest in the provision of the service received after the due date may not be considered by the Commission and the Council. After reception of the expressions of interest, the subsequent work of the Air Navigation Commission and the Council would be in accordance with the schedule.

Accept, Sir/Madam, the assurances of my highest consideration.


Fang Liu
Secretary General

ICAO calls for a global space weather service

proposers will be audited by WMO

contingencies and back-ups

single entities or consortium

a space weather information service

deadline Sept 8 2017

self-funding for 3 years

24h/7d

expertise space weather information provider

access, observations, data rights

numerical models capable of ingesting observations from multiple sources

high reliability, redundancy, backup

liaise with space weather info providers

real time and forecast info of impact

quality management

gather feedback from aviation decision makers

performance monitoring, forecast verification

radiation at flight levels

GNSS

HF comm

personnel training program

MOD/SEV

every 6 hours or as soon as needed

geographic extension

disseminate via appropriate ICAO channels

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An STCE response

- None of our institutes can do it alone: ROB: Solar & GNSS, BIRA: radiation, KMI: 24h operations & Dourbes
- STCE executive committee (2017 June 15):
“If we don’t do this, then why does the STCE exist?”
- STCE steering committee
“Agreed that is a first priority for STCE”
- RMI/Daniel Gellens
“24h operations can be supported by RMI weather room”

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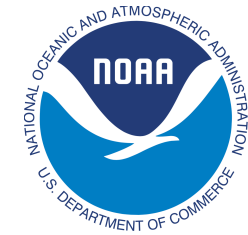


**Remarkably
fast and efficient
decision process**

Partners?



Solar-Terrestrial
Centre of
Excellence



Italy



Netherlands



United
Kingdom



Austria



Poland



Germany

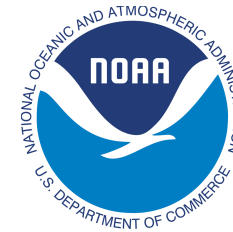


Finland



France

Partners?



Solar-Terrestrial
Centre of
Excellence



Italy



Netherlands



United
Kingdom



Austria



Poland



Germany



Finland



France



We have a hard time defending our interests internationally

Partners?



DG Luchtvaart



Solar-Terrestrial Centre of Excellence



ISES
International Space Environment Service



European Commission



EASA
European Aviation Safety Agency



EUROCONTROL



esa

space situational awareness



Italy



Netherlands



United Kingdom



Austria



Poland



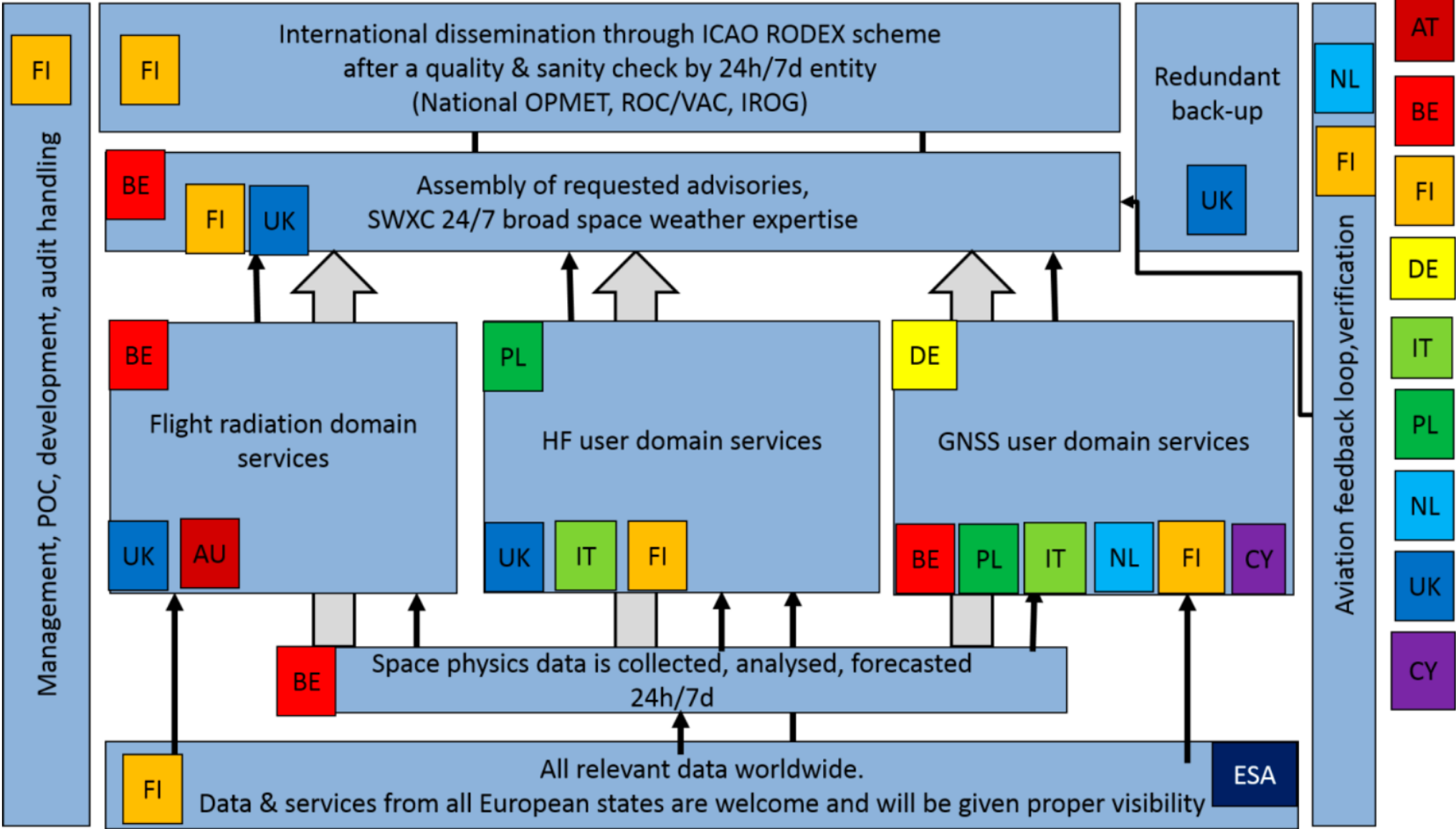
Germany



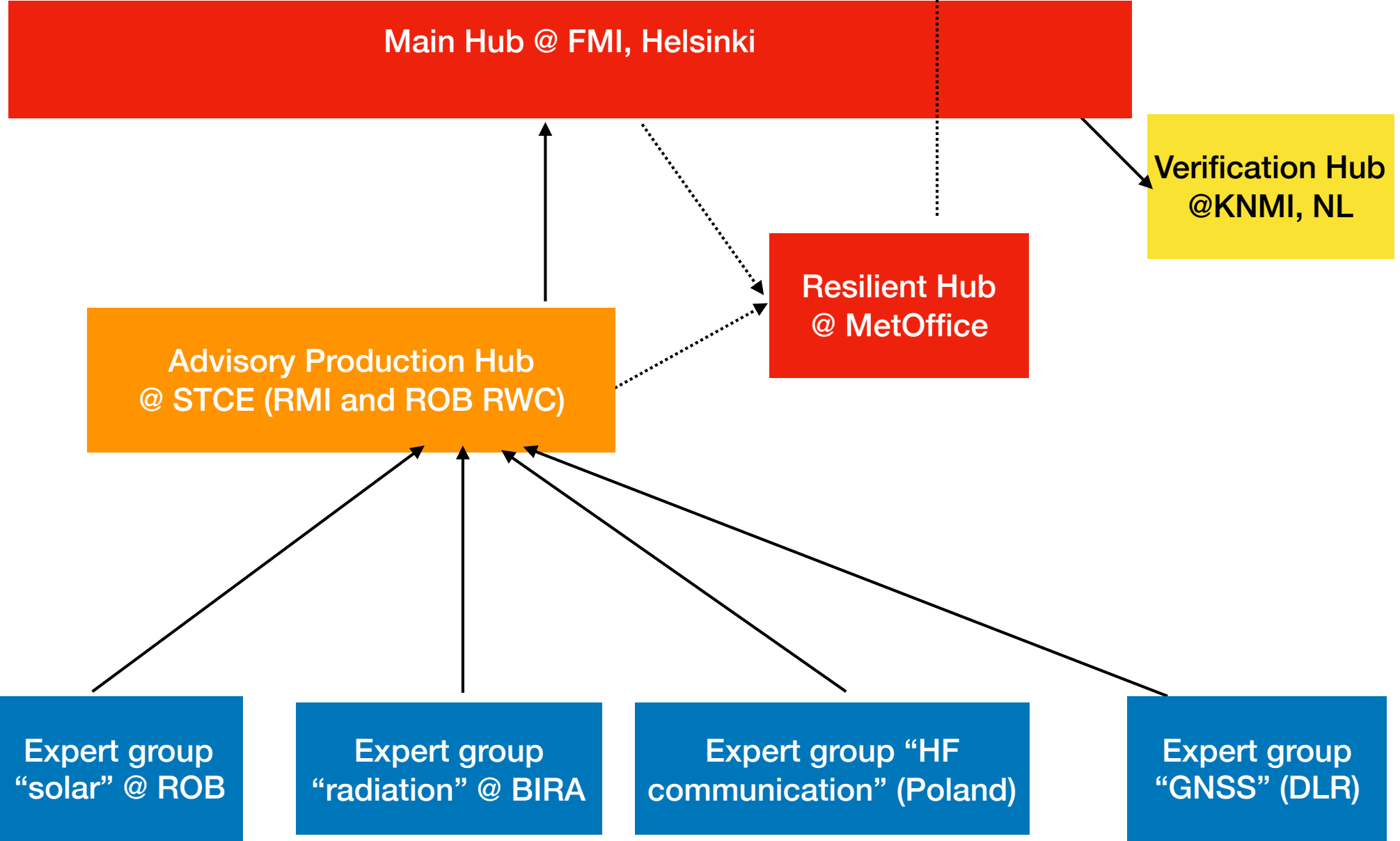
Finland



France



↑ **Outgoing space weather messages**



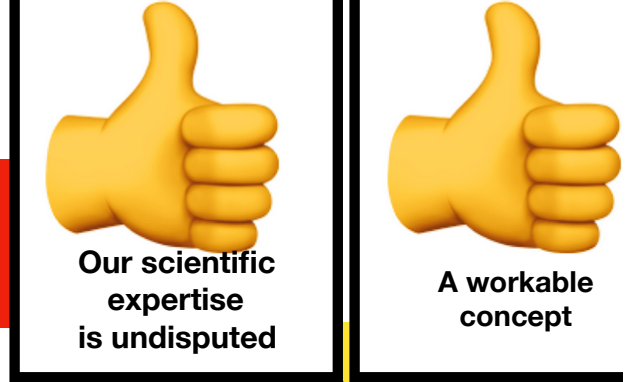
Operational, manned 24/7, outgoing advisories

Operational, manned 24/7

Operational processes 24/7, manned on call

Manual/automated analysis, office hours

Outgoing space weather messages



Main Hub @ FMI, Helsinki

Verification Hub @KNMI, NL

Resilient Hub @ MetOffice

Advisory Production Hub @ STCE (RMI and ROB RWC)

Expert group "solar" @ ROB

Expert group "radiation" @ BIRA

Expert group "HF communication" (Poland)

Expert group "GNSS" (DLR)

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Outgoing space weather messages



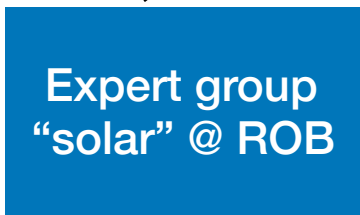

Our scientific expertise is undisputed


A workable concept

Verification Hub @KNMI, NL




STCE is not ISO 9001 compliant nor fully operational

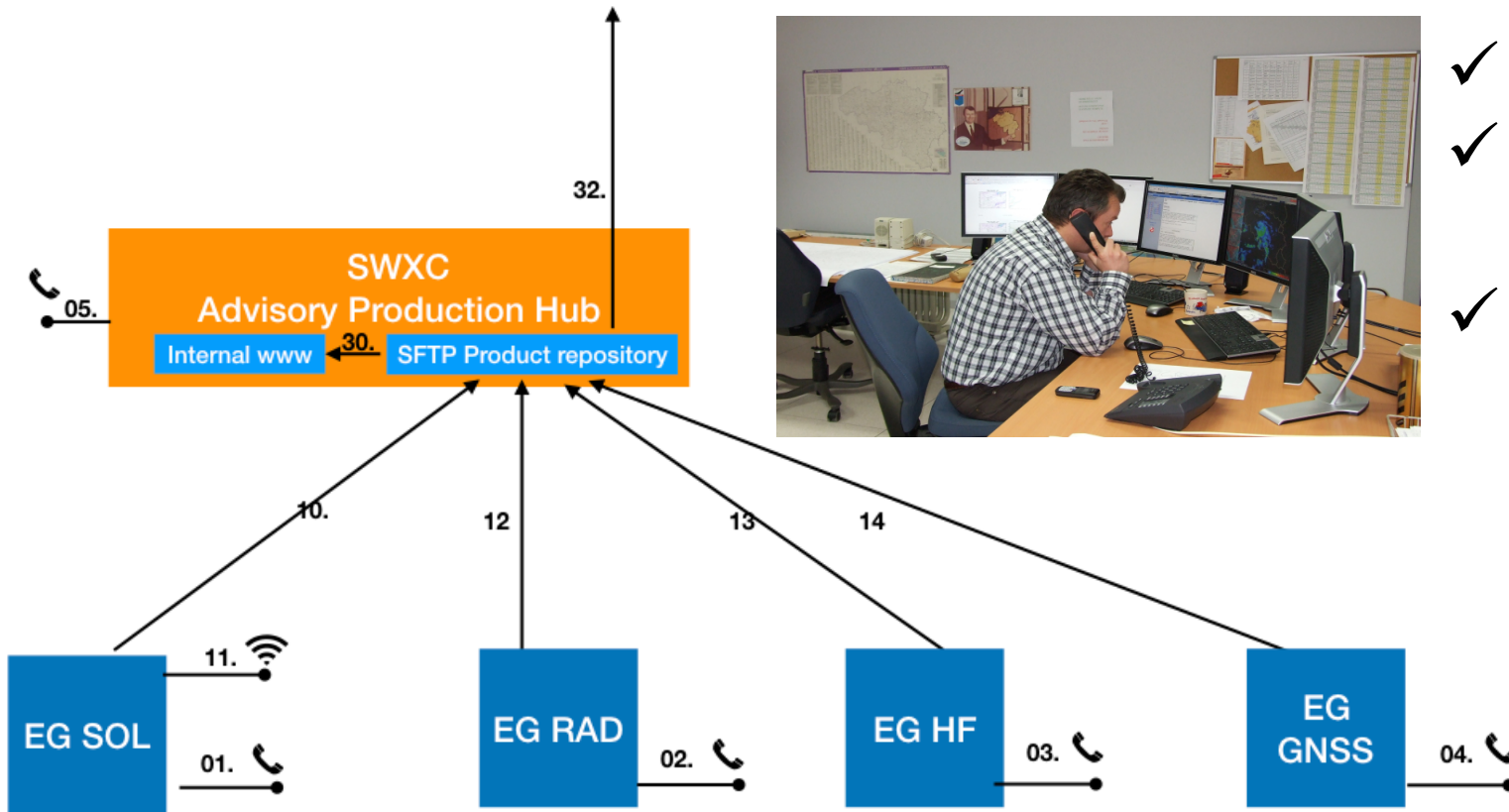


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- ✓ RMI Meteo Room
- ✓ RWC space
weather forecasters
- ✓ specific IT
infrastructure

**Training of
RMI Meteo Room**

**No guarantee of
our IT infrastructure**

**No manpower for
IT developments**



Successful audit



**WORLD
METEOROLOGICAL
ORGANIZATION**

PROSPECTIVE SPACE WEATHER INFORMATION PROVIDER

POST-AUDIT REPORT – PECASUS

Space weather information provider:	Pan-European Consortium for Aviation Space Weather User Services (PECASUS)
Prospective space weather centre (primary):	Finnish Meteorological Institute (FMI)
Prospective space weather centre (backup): (where applicable)	United Kingdom Met Office Space Weather Operational Centre (MOSWOC)
Date and location of site assessment(s) and audit(s):	12 - 14 February 2018, Helsinki, Finland and 16 February 2018, Exeter, United Kingdom

The PECASUS consortium has found to be **compliant in all respects by the audit team. The consortium produced sufficient evidence to satisfy the auditors that the global service they propose to offer will comply with the requirement laid out by ICAO. Of particular note, FMI, the UK Met Office and the **STCE are already very experienced providers of space weather services**, nationally and within Europe, and have strong relationships with operational centres such as SWPC (USA) and the research and academic communities to ensure they remain at the forefront of the science.**



Succesfull audit

Listed in alphabetical order by State/consortium	Institutional	Operational	Technical	Communication / Dissemination
Australia, 21 and 22 February 2018				
Space Weather Services (SWS), Sydney	A	A	A	A
Canada, 27 and 28 February 2018				
Canadian Space Weather Forecast Centre (CSWFC), Ottawa	A/B	A	A/B	A
China, 29 and 30 January 2018				
National Centre for Space Weather (NCSW), Beijing	A	A	A	A
France, 15 and 16 February 2018				
SPECTRA consortium*, Toulouse	A/B	A	A/B	A
Japan, 1 and 2 February 2018				
Space Environment Laboratory (SEL), Tokyo	A	A	A	A
PECASUS, 12 to 14 and 16 February 2018				
PECASUS consortium**, multiple locations	A	A	A	A
Russian Federation, 19 and 20 February 2018				
Institute of Applied Geophysics (IAG), Moscow	A/B	A/B	A	A
South Africa, 24 and 25 January 2018				
South African National Space Agency (SANSA), Hermanus	A/B	A/B	A/B	A
United States, 13 and 14 March 2018				
Space Weather Prediction Centre (SWPC), Boulder	A/B	A	A	A





**Not lobbying
pro-actively enough**

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China, 29 and 30 January 2018				
National Centre for Space Weather (NCSW), Beijing	A	A	A	A
France, 15 and 16 February 2018				
SPECTRA consortium*, Toulouse	A/B	A	A/B	A
Japan, 1 and 2 February 2018				
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South Africa, 24 and 25 January 2018				
South African National Space Agency (SANSA), Hermanus	A/B	A/B	A/B	A
United States, 13 and 14 March 2018				
Space Weather Prediction Centre (SWPC), Boulder	A/B	A	A	A



ICAO decision in autumn



Stuff to be happy



Stuff to improve



Stuff to be happy

- within STCE, we can decide quickly and collaborate efficiently
- our scientific expertise is undisputed
- the PECASUS team is very collaborative, the concept is sound and we passed the audit
- intra-STCE trainings started well



Stuff to improve



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Stuff to improve

- even together, we are hardly strong enough to play with the big boys
- not sufficient mobilisation of personnel
- our organisation is not professional enough
 - no quality management system for external services
 - oma.be is not managed as an operational infrastructure