THE SSA CHALLENGES FOR INDIA WORKSHOP 14 – 15 JUNE 2018

GLOBAL SSA CAPABILITIES AND DATA SHARING – STATUS AND TRENDS

A EUROPEAN PERSPECTIVE

Ralph “Dinz” Dinsley BA(Hons) MA
Associate – Reflecting Space

SCOPE

- History of UK SSA Contribution
- UK Capabilities
  - Military
  - Civil
  - Future
- Collaboration
  - Military
  - Civil
- Commercial
  - SDA
  - Other
- Conclusion

History of UK SSA Contribution

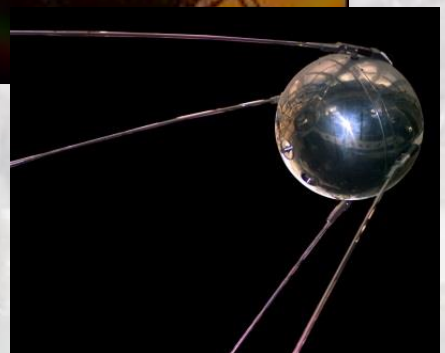

Russians Win Race To Launch Earth Satellite

Man On Threshold Of Space Travel

How To Spot Satellite

U.S. May Speed Up Satellite Program

1957



1963

1990

2007

2008

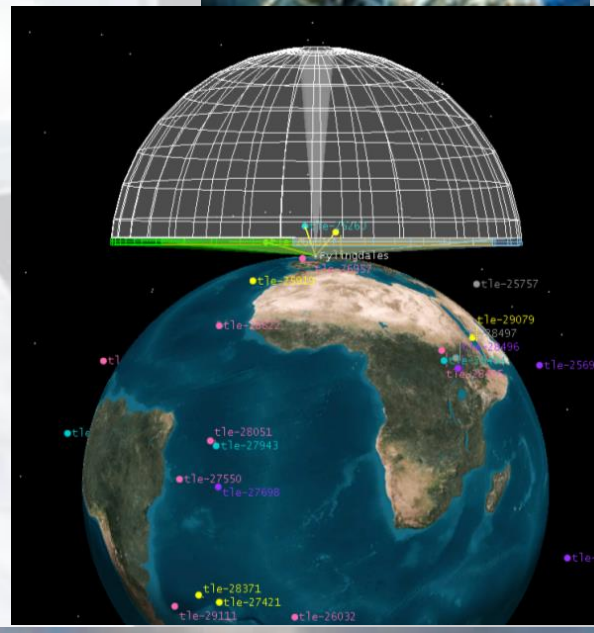
RAF FYLINGDALES

Ballistic Missile Early Warning System (BMEWS)

1960 - Site I - Thule AB, Greenland

1961 - Site II - Clear AFS, Alaska

1963 - Site III - RAF Fylingdales



- **1990-92 Upgrade to SSPAR**
- **2007-11 Upgraded Early Warning Radar**

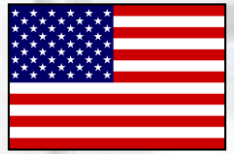
UK SPACE OPS CENTRE
(UK SPOC)

To deliver AIR's space control and space force enhancement support capability iot UNDERSTAND and EXPLOIT the space domain, to PROTECT our access to critical space capabilities, DEFEND our national interests and integrate space control into UK military operations.

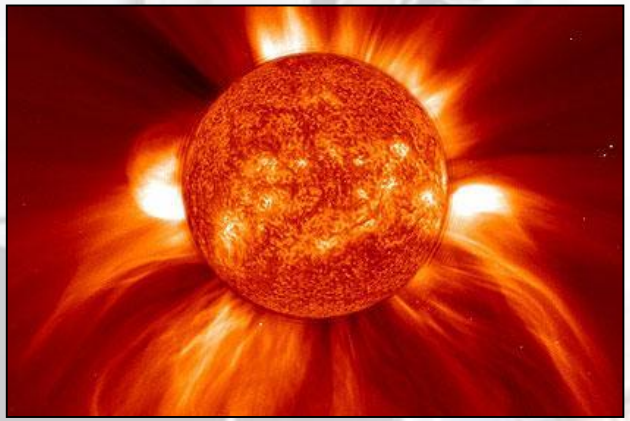
UK Civil and Commercial Capabilities

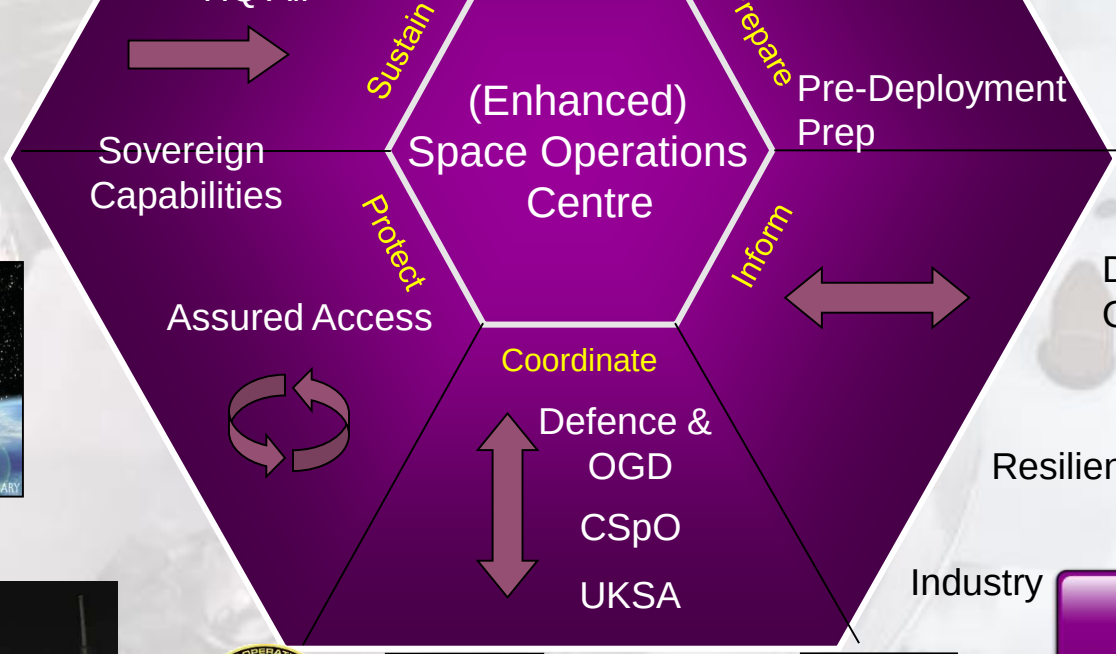
UK Future Development





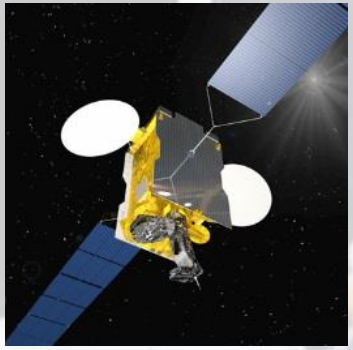
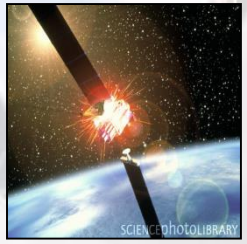





Defence & OGD

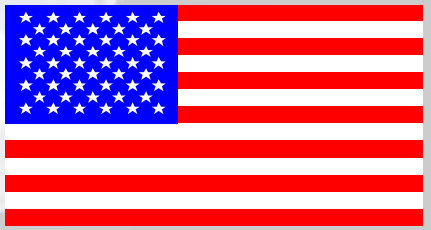
Resilience

Industry


Combined Space Operations Initiative

- Initial focus of SSA
- NSS 2010 & NSSP 2014
- UK SpOC & Fylingdales
- Initially ‘5EYES’Community
- Military
- Extending to include France and Germany
- Potential to grow to include others!


EU Space Surveillance & Tracking Framework

- **Decision of the European Parliament and EU Council 16 April 2014 establishing a Framework for SST Support**

- **Ensuring the long-term availability of European and national space infrastructure (article 3)**

- **With the aim to (article 4): Establish a SST capability…with an appropriate level of autonomy » :**

(a) The establishment and operation of a sensor function consisting of a network of Member State ground-based and/or space-based sensors, including national sensors developed through ESA, to survey and track space objects and to produce a database thereof;

(b) The establishment and operation of a processing function to process and analyse the SST data at national level to produce SST information and services for transmission to the SST service provision function;

(c) The setting up of a function to provide SST services as defined in Article 5(1) to the entities referred to in Article 5(2).

European Union Capabilities

11 Radars

Mode	Name	MS
Surveillance	GRAVES	FR
	BIRALES	IT
	S3TSR*	ES
Tracking	TIRA	DE
	MSSR Santorcaz	ES
	CASTR	UK
	SATAM (3)	FR
	BIRALET	IT
	MFDR	IT

* Not in operation yet, start of operation planned for mid 2018

4 Laser stations

Mode	Name	MS
Tracking	SLR Graz	DE
	ROA SLR	ES
	MLRO	IT
	SGF (Herstmonceux)	UK

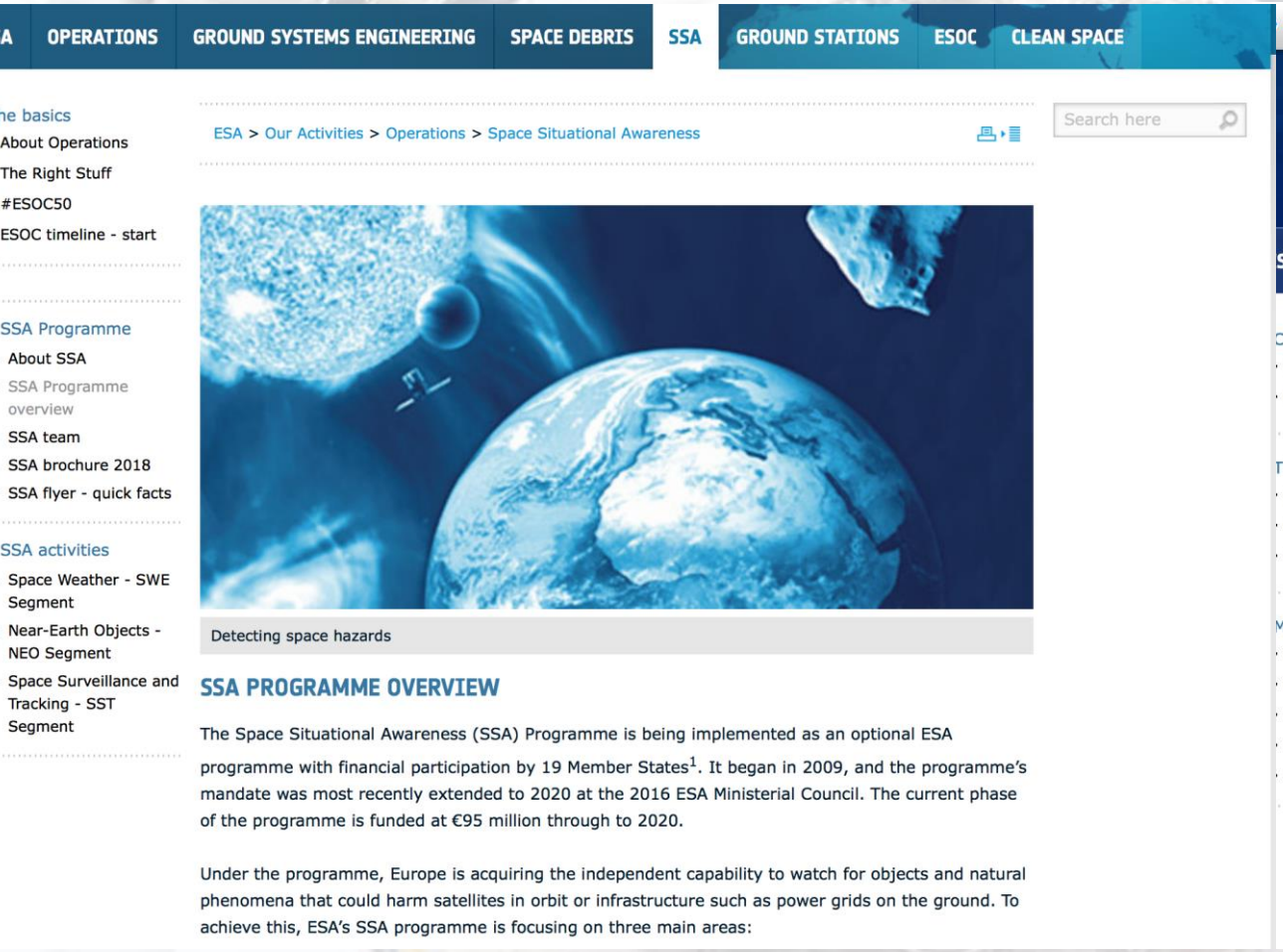
19 Telescopes

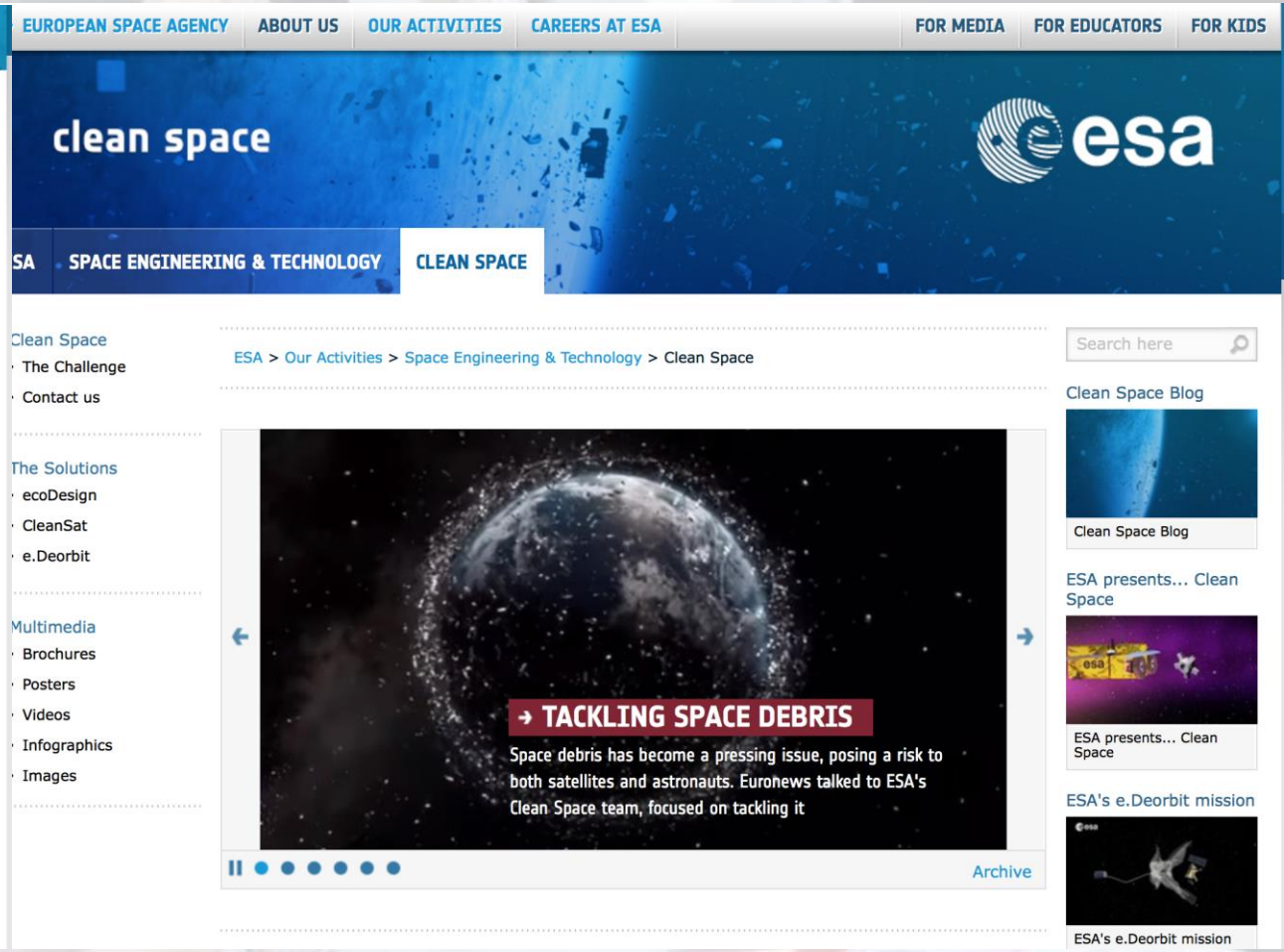
Mode	Name	MS
Surveillance	Centu 1	ES
	TFRM	ES
	TAROT network (3)**	FR
	Starbrook**	UK
	SPADE**	IT
	PdM-MiTe**	IT
Tracking	Tracker 1	ES
	TJO	ES
	IAC80	ES
	BOOTES network (3)	ES
	ANTSY	ES
	CAS	IT
	GEOF	UK
	COATS	UK
	Cassini / Loiano	IT

***Those surveillance telescopes are also used for tracking purposes*

Sensor -
Worldwide geographical distribution

European Space Agency





Commercial

- Space Data Association (SDA)
- Other
  - ExoAnalytic Solutions
  - Leolabs
  - Analytical Graphics Inc
  - RT Logic

Conclusion

Collaboration is Key

- Congested
- Contested
- Competitive

- Complement
- Cooperate
- Collaborate