IAC-05-E.6.1.05

REGULATORY FRAMEWORK FOR THE DISTRIBUTION OF REMOTE SENSING SATELLITE DATA: GERMANY'S DRAFT LEGISLATION ON SAFEGUARDING SECURITY INTERESTS*

Dr. Michael Gerhard
Assistant to the Member of the Executive Board, Space Agency
German Aerospace Center (DLR)
D-53227 Bonn, michael.gerhard@dlr.de

Dr. Bernhard Schmidt-Tedd
Head, Legal and Business Support Space Agency
German Aerospace Center (DLR)
D-53227 Bonn, bernhard.schmidt-tedd@dlr.de

ABSTRACT

The increasing of private activities in outer space has entailed first private operators of remote sensing satellite systems. Furthermore, data generated by remote sensing satellite systems are meanwhile of high spatial resolution. The distribution of these data might harm national security and foreign policy interests. States therefore aim at regulating access to those data.
This article introduces a draft regulatory framework for the distribution of remote sensing satellite data, which is intended to come into force in Germany by mid 2006. The draft legislation will also be compared to the Canadian draft legislation as well as to the existing legislation in the United States.

I. BACKGROUND

Germany has become a leading supplier in sensor technology, especially SAR[1]. Based on the experiences of AMI sensor on board of ERS-1 and ERS-2 satellites and X-Band contributions to three Shuttle missions (two flights of X-SAR and one flight of SRTM), Germany is going to launch TerraSar-X in 2006.

TerraSAR-X is a new generation, high resolution satellite operating in the X-band at 9.65 GHz. The launch of the 1-ton satellite into a 500 km orbit is planned on top of a Russian-Ukrainian rocket and is to be operated for a period of at least 5 years. The sensor is able to produce data of high spatial resolution (up to 1 meter). The project will open a large potential for the scientific utilisation of radar data and simultaneously will mark a milestone for sustained commercial exploitation of remote sensing data.[2]

The German Ministry of Education and Research, the German Aerospace Center (DLR) and the space company EADS

Astrium GmbH have agreed on an innovative co-operation scheme for the implementation of earth observation satellites by realising Germany's first Earth observation space project based on public-private partnership with considerable contribution by the industry. With regard to data distribution DLR will be responsible for the scientific use of the geo-information (data) gathered while exclusive commercial marketing will be carried out by Infoterra GmbH, a subsidiary of EADS Astrium GmbH specialised in the collection and processing of air- and satellite-sourced data.

With regard to optical sensors, RapidEye AG is going to establish a commercial satellite-based geo-information service in 2007. The system consists of 5 small satellites which are intended to provide information products and services for agriculture cartography and other markets.[3] Although having a spatial resolution lower than TerraSAR-X (6,5 m) and although its sensor can image only five spectral bands,[4] its daily revisits and full global coverage might be on the threshold of national security and foreign policy interests.

Meanwhile Germany has started a call for a new national earth observation mission and selected the two advanced conpepts Tandem-X and EnMAP for Phase A (feasibility) study. One of both projects will be supported by DLR in Phase B/C/D (design, development and construction). The new mission will likely be realised also as a public-private-partnership.

In 2004 a discussion started about how to protect the security interests of Germany and its allies as well as how to protect specific foreign policy interests – while at the same time supporting commercialisation of the capabilities of remote sensing satellites by defining a reliable and transparent policy. The policy initiative is going to be implemented into legislation and is intended to be introduced into Parliament by the end of 2005.

II. CONCEPT OF THE REGULATORY FRAMEWORK

The proposed concept for a German regulatory framework for the distribution of remote sensing satellite data aims at safeguarding security as well as supporting commercialisation.

While the necessity of safeguarding security and foreign policy interests guides the contents of the regulations of the draft legislation, the concept of the draft tends to support commercialisation at the best. Even for the first mission TerraSAR-X well above hundreds transaction of remote sensing satellite data per day can be expected. Therefore implementation of a security data policy has to be efficient to keep interferences with business process as little as possible while securing governmental security requirements.

One important element to achieve this to introduce an introducing a up-stream assessment of the ability of the remote sensing satellite system, as well as a two-tiered examination of the transaction directed towards the distribution of satellite remote sensing data.

The up-stream check on the ability of the remote sensing satellite system aims at factoring out those remote sensing satellite systems, which are not "advanced", i.e. able to generate data which might harm national security interests or foreign policy interests. In consequence, remote sensing satellite systems which are not qualified as potentially harmful to these interests are not subject to the further regulations of the draft legislation. Since such qualification will be needed prior to the launch of the satellite, legal security will be achieved for

operators of remote sensing satellite systems.

The two-tiered examination of transactions directed at distribution of data (of advanced remote sensing satellite systems only) shall facilitate procedures of security assessment, especially for data distributors. Although he is distributing data of an advanced remote sensing satellite system, the specific data is not necessarily sensitive to security or foreign policy interests. Such data might e.g. be generated by operating the sensor in a low-resolution mode or by degrading the data during the basic processing in the ground segment. In this case, a regulatory licence to distribute the data is not necessary – and would only put additional complexity on the transaction process, probably also delaying the transaction and increasing costs. Therefore, the German draft legislation passes on the requirement to apply for a licence for every single transaction of data generated by advanced remote sensing satellite systems. Instead, the distributer is simply obliged to examine the sensitivity of the envisaged transaction according to the technical parameters of the data and a geomatrix provided by the appropriate authority (first tier). Only in case this examination arrives at the conclusion that the transaction is sensitiv, he has to apply for a licence (second tier).

This concept is aiming at enabling (operators and) distributers to conduct their business expeditiously and effectively – with a lot of personal responsibility for Germanys security and foreign policy interests.

III. PROPOSED REGULATIONS

Against that background, the German draft regulatory framework for the distribution of remote sensing satellite data requires three types of licences, all of them connected to some additional requirements by law: One licence required by the operator of an advanced remote sensing satellite system to operate the system, two licences to the distributor of remote sensing satellite data; a general one in order to licence his reliability and one licensing a specific transaction of a data or a set of data.

1. Lincence to operate advanced remote sensing satellite systems

Operators under the draft legislation will have to apply for operating an "advanced" remote sensing satellite system. The draft legislation will provide criteria, when such system is qualified as advanced. Such criteria will be determined with regard to security and foreign policy interests. They aim at identifying the potential of the satellite system, i.e. whether or not the system is able to (theoretically) generate data which might be detrimental to German security and foreign policy interests. If the satellite system is qualified as advanced, the operator will be required to follow a set of rules ensuring that the satellite can not be commanded by any unauthorised person, that no data can be downlinked by or to unauthorised persons and that the control is exercised from German territory (in order to have effective jurisaction). Furthermore the operator must proof his ability to operate the satellite system pursuant to the legislation. He will be finally required to report adequately to the authorities, to grant access to officials of the authority and to document commands and encryption procedures. If the remote sensing satellite system is not qualified as advanced, no restriction will be made neither to the operator nor to any person intending to distribute data generated by such a satellite system.

2. Licence to distribute remote sensing data

Data generated by an advanced remote sensing satellite system may only be distributed – according to the draft legislation introduced here – if the person first distributing the data is allowed to generally act as a distributor and the specific transaction does not harm German security and foreign policy interest.

a. Allowance to act as a data distributor

The distributor of data generated by advanced remote sensing satellite systems has to take some responsibilities to ensure the purpose of the draft legislation. Therefore he is required to apply for an operators licence. By that his reliability and his ability to pre-assess the sensitivity of a transaction according to the requirements given by the authority is checked. At the same time the operator will be obliged to ensure that no unauthorised person might get access to data in his possession.

b. Sensitivity check / licence to distribute

With regard to every single transaction (of data generated by an advanced remote sensing satellite system) the distributor has to check consequences for Germany's security and foreign policy interests. This check will be done according to a set of requirements provided by the appropriate authority, considering the technical parameter of the data, the territory sensed, the time of generation of the data, the time of delivery, the person to be delivered and the intended end-use (geo-matrix). In case the technical parameters and this geometrix come to the result that security or foreign policy interest might be harmed, the distributor has to apply for a licence. Otherwise he can perform the transaction.

The criteria and predefined procedures should be openly available, clear and without any power of discretion in order to allow an electronic assessment by the distributor. Nevertheless the distributor will be obliged to document every single query for transaction including the assessment as described above.

Transactions which require a licence by the appropriate authority will be assessed on a case by case basis. While the assessment of the distributor is just intended to indicate whether national security or foreign policy interests might be harmed (and therefore the filter will be rather wide), the authority is assessing whether or not this is the case.

3. Other regulations

With regard to the protection of high-ranking interests of the government, the legislation as proposed will reserve a right to prior tasking for governmental purposes as well as a right to prior distribution of data to the government. Anyhow, these governmental rights will be restricted to rare cases of national crisis.

The German draft regulation is restricted to security aspects with regard to the distribution of data. Any other aspect of data policy will explicitly not be dealt with.

4. Relation to other domestic legislation

Regulations which aim at restricting the distribution of remote sensing satellite data for security interests slightly touch other aspects of domestic regulations.

The Foreign Trade and Payments Act FDPA)[5] has a similar purpose as the draft regulatory framework for the distribution

of remote sensing satellite data: to avoid threats or hazards to the national security and to protect foreign policy interests. To that end, the FDPA also restrict distribution (here of goods listed in the EC Regulation N° 1334/2000 with regard to intra-Community transfers and exports of dual-use items and technology[6]). Although one might consider extending the sphere of application of the FDPA by including remote sensing satellite data into the term of "goods", such would not meet the intention of the draft legislation introduced here. The FDPA can only restrict the exportation of goods. But security interests might also be affected if data are distributed within the domestic territory. Nevertheless both legislation have to establish parallel thresholds of relevance. If the (draft) regulatory framework on the distribution of remote sensing satellite data forbids the distribution of certain data (generated by a German remote sensing satellite system) to certain people, national security interests are endangered if those people can get an export licence for an advanced satellite which they ask to build in Germany instead of asking for the data.

The German draft legislation does not intend to qualify remote sensing satellite data as classified documents. Hence, the Requirements and Procedure of Federal Security Examinations (SÜG)[7] do not apply.

There are some legislation which oblige the government to provide access to certain "information": the Environmental Information Act (UIG)[8], the Freedom of Information Act (IFG)[9] and the directive 2003/98/EC on the re-use of public sector information. But these legislation are not in conflict with the draft legislation introduced here. Already an analysis of the respective sphere of application comes to the conclusion that remote sensing satellite data are no "information" in terms of these legislation. In any case, these legislation only provide for access to information (and do not restrict it) – and these legislation are already drafted in such a way that access is granted only subject to national security aspects.

5. Repercussions of international space law

The distribution of satellite remote sensing data only has few repercussions of international space law.

It has to be clear that the operation of satellites, being part of a remote sensing satellite systems is subject to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space (OST) and the other United Nations Treaties and Principles on Outer Space.[10] Since the legislation introduced here typically deals with non-governmental operators,[11] an authorisation is necessarily based on Art. VI (2) OST, whose requirements and procedures are further developped by national space legislation.[12] Such legislation exists next to the legislation on distribution of data. It just has to be linked appropriately.[13]

Satellite remote sensing is also affected with by UN Resolution 41/65, Principles Relating to Remote Sensing of the Earth from Outer Space. Principle XII (1) of this resolution states: "As soon as the primary data and the processed data concerning the territory under its jurisdiction are produced, the sensed State shall have access to them on a non-discriminatory basis and on reasonable cost terms." This provision is clearly linked to the distribution of remote sensing data. But it does not restrict the distribution of data, as the legislation on regulating the distribution of remote sensing satellite data aims at. Principle XII rather tends to expand its distribution: the sensed State

may claim access to the data of its territory (just for clearness it has to be recalled, that the Resolution 41/65 is no treaty but a declaration of legal principles, by the UN and therefore does not create –rights and – obligations to States). Domestic regulations can transfer the motivation set on the Government (of a State participating in remote sensing activities) onto non-governmental entities. In consequence, they also have – by domestic legislation – to give non-discriminatory access on reasonable cost terms to a sensed State, such being a customers to the non-governmental entity. By interpreting the terms "non-discriminatory" and "reasonable" or by imposing that security aspects prevail on Principles XII distributions, the legislating Sate can restrict the access of the sensed State to data of its own territory due to security or foreign policy interests.

Thus, Principle XII of UN Resolution 41/65 is only of indirect relevance for regulations on the distribution of remote sensing satellite data which solely deal with security aspects. As soon as such legislation also deals with general aspects of data policy, Principle XII becomes relevant.

IV. ORIGINS AND STATUS OF THE LEGISLATION

Starting in 2004, an interministerial working group developed a concept of a German data policy for remote sensing satellite systems. This policy always was restricted to security aspects of a data policy. DLR provided support acting as the assigned space agency.

Already in the early beginnings, other ministries and authorisations concerned were involved in the process.

The concept suggested the regulations introduced here to a large extent. At the same time it was recommended to transform the policy concept into a formal legislation to be adopted by the parliament.

When this contribution has been prepared, the draft legislation was still an internal discussion paper and is still subject to some changes. References to the wording of special articles are therefore not possible; neither is a comprehensive and terminating delineation.

V. REGULATORY REGULATIONS ON THE DISTRIBUTION OF REMOTE SENSING DATA IN US AND CANADA

In conformity to the technical expertise of non-governmental entities of building and operating advanced remote sensing satellite systems, only two States have enacted similar legislation up to now.

a. United States

In the United States two firms are licensed to operate remote sensing space systems: Digital Globe and Orbview. On the basis of that licence, DoC (NOAA) can restrict generation and distribution of data which might be harmful to national security. Legal basis for the operations licence and any restrictions in data access is the Land Remote Sensing Policy Act 1992 (USC 15 Chapter 82, Sec. 5621 et seq.), the MoU among the DoS, DoD, DoC and the Intelligence Community concerning the Licensing of Private Remote Sensing Satellite Systems of December 1999 and two Presidential Directives on Space: PDD 49 (September 19, 1996) and NSDP 27 (April 25, 2003). The Regulations on Licensing of Private Land Remote Sensing Space Systems (15 CFR Part 960 as of July

31, 2000) implement the provisions of the Act, the MoU and the policy directives.

These rules recognise commercial remote sensing satellite systems in the governmental remote sensing architecture and aim at maintaining the nation's leadership in remote sensing space activities as well as sustaining and enhancing the US remote sensing industry.[14] A minimum requirement for the licensing, monitoring and compliance of the operator is given, especially by the Regulations.

b. Canada

In Canada, the launch of RADARSAT-2 gave rise to a regulatory implementation of the 1999 Access Control Policy for the regulation of commercial remote sensing satellite systems. RADARSAT-2, currently scheduled for launch in 2006[15], will be owned by the private sector, albeit with upstream financial support of the Canadian Space Agency.

The Canadian Access Control Policy[16] aims at maintaining Canada's industrial base, advancing its technology, creating economic opportunities and safeguarding the lives of Canadians and their allies.[17]

On June 16, 2000 Canada und the United States entered into a bilateral agreement concerning the operation of commercial remote sensing satellite systems.[18] The agreement specifically covers the operation of RADARSAT-2 as well as all future Canadian commercial remote sensing satellite systems owned, operated or registered in Canada.

Based on the policy and implementing the Government to Government agreement a regulatory regime for commercial remote sensing satellite systems was drafted: Bill C-25, Act governing the operation of remote sensing space systems (38th Parliament – 1st session).[19] It has not yet come into force.[20]

c. Differences in the (draft) regulations of US, Canada and Germany

Without going into detail[21] some significant differences between the US regulations and the Canadian draft legislation on the one hand and the German draft legislation on the other hand should be mentioned here.

The US regulations and the Canadian draft concentrate on a licence to operate a remote sensing satellite system. Access control to data generated by such satellite system and any other rights reserved to the Government is linked to that licence. The concept described here clearly distinguishes the role of the satellite operator and the distributor. Although in general the role of the satellite owner, the satellite operator and the data distributor are combined in one organisation, this concept allows handling the new PPP-models by clearly assigning different obligations and responsibilities to parties involved.

For example, the concept is easily applied to the TerraSAR-X public-private partnership agreement, where the ownership of satellite belongs to DLR on behalf of the German Government. DLR is the operator of the satellite system. But two entities are going to distribute TerraSAR-X data: DLR is entitled to use data generated by that satellite for scientific purposes only. The commercial right of use is granted to Infoterra GmbH, a private commercial entity.

Most aspects of the German draft legislation focus on the distribution of the data by the distributor (with regard to TerraSAR-X this would be DLR and Infoterra GmbH), because the distributor is

held responsible to properly control access to the data. The operators of the satellite systems only have to ensure that no unauthorised person can command the satellite, downlink or otherwise access data.[22]

d. Policy declaration of other States

Other States having means to operate advanced remote sensing satellite systems generating data which might be commercial distributed have (at least) internal policies. Thus, there exist statements that in France, India as well as in the Russian Federation data policies are applied, even though some of them are not published.

e. Future regulations in other States

As soon as non-governmental entities in other States turn out to have the same capacity, it is expected that more legislation on the distribution of remote sensing satellite data will pass (e.g. India, Italy ...).

VI. CONCLUSIONS

Following its technical ability to build and operate remote sensing satellite systems of very advanced capability, Germany is besides Canada the next State which follows the United States in setting up a regulatory framework for the distribution of remote sensing satellite data. Purpose of such legislation are security and foreign policy interest on the one hand and support of the national remote sensing industry on the other hand. The draft legislation focuses on the authorisation of distribution of remote sensing satellite data, having restriction in the operation of the satellite system only as an (essential) preliminary question. The concept described here shares the aims of the existing US regulation and the Canadian draft legislation and tries to incorporate the experience gained with these regulations as well as the specific reqirements to effectively deal with ppp-models, which are expected to be of growing relevance in Europe and elsewere. It is designed to be general and also cover future satellite projects as well as complex operational models with distributed roles for satellite ownerns, satellite operators and data distributors.

The general aim is to give data distributors an effective and predictable framework for commercialisation of spaceborne remote sensing data, while at the same time giving the government a tool to ensure national security interests as well as to protect specific foreign policy interests. The core of the regulation are procedures for the distribution of data from advanced satellites. Distribution requests which are "sensitive" according to technical parameters and a geomatrix provided by the appropriate authority have to apply for authorisation. Anything else can be distributed according to simple predefined procedures on the personal responsibility of the distributor, who will be controlled by the authority.

---

* The views expressed herein are those of the authors.

[1] Syntetic Apertur Radar.

[2] Information on TerraSAR-X: *Martin Suess, Sebastian Riegger, Wolfgang Pitz, Rolf Werninghaus*, TERRASAR-X – Design and Performance, in: Proceedings of EUSAR2002, Köln, 2002; *Rolf Werninghaus, Wolfgang*

Balzer, Stefan Buckreuss, Josef Mittermayer, Peter Mühlbauer, The TerraSAR-X Mission, in: Proceedings of EUSAR 2004, Ulm 2004; *Isabel Zerfowski*, TerraSAR-X Mission, in: Stefan Dech (Hrsg.), Tagungsband 20. DFD Nutzerseminar 2003, pages 20 et seq.

[3] Cf. http://www.rapideye.de/ and http://www.dlr.de/os/forschung/projekte/rapideye.

[4] A full description of the spacecraft is given by *George Tyc / Gary Buttner / Manfred Krischke / Michael Oxfort,* The RapidEye Spacecraft, in: 4th IAA Symposium on Small Satellites for Earth Observation, Berlin, Germany, April 2004l, IAA-B4-1105; *George Tyc / John Tulip / Daniel Schulten / Manfred Krischke / Michael Oxfort,* The RapidEye Mission Design, in: 4th IAA Symposium on Small Satellites for Earth Observation, Berlin, Germany, April 2004l, IAA-B4-1102.

[5] BGBl 1961 I 481, 495, 1555.

[6] Slightly extended by some domestic interest within the annex to the decree to the FDPA.

[7] BGBl. 1994 I 867.

[8] BGBl. 2004 I 3704.

[9] Cf. Parliament (Bundestag) Material 15/4493 http://dip.bundestag.de/btd/15/044/1504493.pdf as amended by material.15/5606 and Bundesrat Drs. 450/15.

[10] A compilation has been published by the UN under its series number A/AC.105/572/rev.3. It has to be mentioned that the recent Resolution 59/115 on the Apllication of the Concept of the Launching State is not yet included in the publication. For reference cf. http://www.oosa.unvienna.org.

[11] Although the expected first case to be applied to the draft legislation introduced here does not: TerraSAR-X is operated by DLR in behalf of the German Government. Only the distribution of data is (partially) left to a private company and therefore subject to the proposed regulations. An authorisation to operate TerraSar-X is not necesaary. The German government is directly bound by the regulations of the OST.

[12] *Michael Gerhard,* National Space legislation – Perspectives for Regulating Private Space Activities, in: Marietta Benkö / Kai-Uwe Schrogl (eds.), Space Law: Current Problems and Perspectives for Future Regulations; *Michael Gerhard,* Nationale Weltraumgesetzgebung, Köln 2002; *Michael Gerhard / Kai-Uwe Schrogl*, Report of the ‚Project 2001' Working Group on National Space Legislation, in: Karl-Heinz Böckstiegel (ed.), ‚Project 2001' – Legal Framework for the Commercial Use of Outer Space, Köln, 2002, pages 529 et seq.; *Michael Gerhard / Kristina Moll*, The Gradual Change from „Building Blocks" to a Common Shape of National Space Legislation in Europe – Summary of Findings and Conclusion, in: Stephan Hobe / Bernhard Schmidt-Tedd / Kai-Uwe Schrogl (eds.), Towards a Harmonised Approach for National Space Legislation in Europe, Cologne 2004, pages 7 et seq.; *Julian Hermida,* National Space Legislation, Dordrecht 2004, *Frans G. von der Dunk,* Private enterprise and public

interest in the 'European Spacescape', Leiden 1998.

[13] As far as the legislation of the United States and Canada choose to primarily regulate the operation of a remote sensing satellite system (by connecting aspects of distribution only to the terms and condition of the authorisation, cf. below), such licence has also to consider aspects of an authorisation based on Art. VI OST. Nevertheless, this is not the concept of the German draft legislation on distribution of remote sensing satellite data; aspects of an Art. VI OST based authorisation are of general relevance and have to be dealt with in a legislation applicable to every space activity, not only to satellite remote sensing. Anyhow – such general legislation does not yet exist.

[14] *Wulf von Kries*, The U.S. Commercial Remote Sensing Policy of April 28, 2003: Some Comments. In: German Journal of Air and Space Law (ZLW) 2003, pages 554 et seq.

[15] http://www.radarsat2.info/.

[16] Unless otherwise indicated, information in this part is based on *M. Lucy Stojak*, Regulatory Framework for Commercial Remote Sensing Satellite Systems: The Canadian Story, IAC-04-IISL.1.02.

[17] Government of Canada, News Release No. 136 (November 23, 2004) at http://w01.international.gc.ca/minpub/Publication.asp?publication_id=381804&Mode=print.

[18] Government of Canada, News Release No.153 (June 16th, 2000), at http://w01.international.gc.ca/minpub/Publication.asp?publication_id=377855&Language=E.

[19] The draft text can be found at http://www.parl.gc.ca/LEGISINFO/index.asp?Lang=E&Chamber=N&StartList=A&EndList=Z&Session=13&Type=0&Scope=I&query=4354&List=toc-1.

[20] Information as of August 24, 2005.

[21] For details on the US regulations cf. the comments in 15 CFR 960, for the Canadian legislation cf. the wording of the draft bill as cited above; an in-depth analysis of the Canadian Access Control Policy as given by *M. Lucy Stojak*, Regulatory Framework for Commercial Remote Sensing Satellite Systems: The Canadian Story, IAC-04-IISL.1.02.

[22] Nevertheless, the German draft concept covers the model of an operator of a remote sensing satellite system being at the same time distributor of data generated with this satellite system.