

SHAPING LEGAL FRAMEWORK FOR COMPASS — REGULATING GNSS IN CHINESE CONTEXT

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Abstract

As an emerging space-faring country, China initiated the plan of establishing an independent global navigation system—COMPASS/Beidou in 2006. COMPASS entails military origins and is still under military operational control. Nonetheless, the opinions on promoting the development of satellites industry issued in 2007 embodied the inclination of China to develop a civil-use based navigation system centered on COMPASS. So Compass presents a promising prospect in future civil GNSS service market, to compete with GPS, Galileo and GLONASS.

However, compared to U.S and E.U, Chinese policy on Compass is yet in place. It is the right time to consider legal aspects of COMPASS because on one hand, the civilian use market deserves clear guidance and regulation, and commercial interests are proved to be at no odds with national security on most occasions; and on the other, the international instrument on third party liability for GNSS service was put on the working agenda of UNIDROIT, and national laws and policies would help China to voice its concern as a perspective stakeholder either in multilateral negotiations or bilateral talks with service user country.

The article will address the regulatory aspects of COMPASS from two angles. One originates from national space policy and law. The identified legal vacuums include license procedure for augmentation providers, security concern and an appropriate State Authority is needed to be in charge of civilian use of GNSS service. The second angle is specifically about the liability issue of GNSS service provider. Prior to the drafting of an international convention on this issue, national laws would play a substantial role in solving the possible claims brought by ender users for the malfunction of GNSS.

I. INTRODUCTION: FOUNDATION AND PROGRESS

The establishment of GNSS-based infrastructure carries many implications for enhancing public welfare and promoting the development of down-stream industries, which always generates tremendous economic outcome. Similar to satellite communication the following market segments are seen: satellite manufacturing, ground control segments, satellite operations, ground based augmentation systems, navigation receivers (space, aircraft, land vehicles, ships, emergency beacons and others), value added services (e.g., cargo and

traffic management).¹

GPS is currently the dominant GNSS system around the world. At the very beginning stage, it was developed by American military sector and used for military purpose. It has become, however, a system that supports numerous non-military applications.² The global value of precision GNSS products and services is approximately S\$3 Billion in 2008 and predicted to grow to a value of between US\$6-8 Billion by 2012, a CAGR of 19-23%.³ The noteworthy point is, GNSS is a typical case to understand the dual-use characteristics of space technology. It provides another example of the convergence

between military, commercial, and civilian space sectors.⁴ However, unlike the other examples in which the military relies on civilian systems, GPS is a U.S. military-operated system relied on by civilians.⁵

China is entering a phase of space-sector development during which even greater emphasis is placed on the commercialization of space technology.⁶ A policy priority during this time is making space more relevant to lives of ordinary people and increasing domestic demand for space-related goods and services.⁷ As an emerging space-faring country, China initiated the plan of establishing an independent global navigation system — COMPASS/Beidou in 2006. The Information Office of China's State Council issued a white paper entitled "China's Space Activities in 2006". It mentioned the endeavor "to improve the "Beidou" navigation satellite test system, and launch and implement the "Beidou" navigation satellite system project."⁸ Compass takes the similar approach of public funding and operation with U.S. GPS. Up to now, it has successfully launched 9 satellites⁹; the Asia-Pacific coverage is to be finished by 2012, and the global coverage by 2020¹⁰. The successful launch of the 8th satellite symbolizes that the construction of the regional system of Compass is finished.¹¹ Along with the five satellites launched in 2010, the "three plus three" system, (three in GEO and three in IGSO), will be able to provide service to most regions of China after on-orbit verification and system reconciliation.¹² The plan for 2011 and 2012 are to launch satellites which are able to satisfy the diversified industrial needs, including survey mapping, fishing, transportation, and meteorology, telecommunication, and water resources,

also the individual needs.¹³

Before looking into the details of regulatory framework, it is necessary to briefly review China's cooperation with E.U. Before 2006, China tried to participate in the construction of Galileo project and conducted bilateral talks with E.U. When Galileo was viewed as a private-sector development with public-sector financial participation, European Commission program managers sought Chinese participation in pursuit of Chinese cash in the short term and privileged access to China's market for positioning and timing applications in the longer term.¹⁴ That business model collapsed, however, and Galileo was transformed into a 100 percent taxpayer-financed project.¹⁵ It is not surprising to see the failure of cooperation, given that the PPPs did not work for private investment within E.U., "many users hesitate to make public and private investments worth the equivalent of billions of Euros or dollars on military systems which can be degraded or switched off at any time due to the national security interests of the owner nation."¹⁶ For China's participation, the observation was put as, "they do not want to be dependent on a critical infrastructure that they don't control."¹⁷ China wanted direct access to the Public Regulated Service, but some of the more security-minded elements in the European Union felt that China was getting too much access to this major strategic type of utility, so they shut them out."¹⁸ Actually, this is only part of the reason for China to launch the Compass initiative. The primary reason is the huge civilian-use market in both domestic and international scene in the era of space commercialization. As GPS became fully operational in 1995, it proved to be an invaluable tool for military, civilian and commercial use and it wasn't long before other space faring nations recognised the

social benefits of creating their own independent systems.¹⁹ The European Union and China found national value in continuing investments to build an independent system of their own while Russia continued to modernise its GLONASS system.²⁰ In coming years, some of the most important space-related products are likely to be receivers and applications that use (perhaps not exclusively) the Compass signals and applications that utilise geospatial data for mining and other resource-management activities.²¹ Secondly, as mentioned above, from the failed strategic cooperation with E.U., China learned that only an autonomous system would avoid the concerns of national security and exclusive access and control. So it launched the project to build Compass, exactly the same as E.U. initiated Galileo. They want to be independent from foreign technology.²² So eventually China came as the new GNSS player and enters into scene in 2006. China's arrival as a GNSS player fills a temporary vacuum created by delays to the European Galileo program, which is now estimated to be running up to four years late.²³

II INTERNATIONAL COOPERATION WITH OTHER GNSS OPERATORS

The great benefit to users is, of course, that the more satellites 'in view' to a GNSS receiver at any given time, the better the positioning data available.²⁴ More satellites means less likelihood of signal dropout interrupting production.²⁵ Multiplicity of service providers may bring about change to GNSS regulation and policy. This has resulted in a state of 'co-operation' between the GNSS providers to prevent conflicting operational uses. One evident example is the change of U.S. national space policy regarding to GPS. Its national space policy on GNSS has been reinforced firstly by the concerns of the users, secondly by the

emerging competitors including Galileo and Compass, the rise of which is about to share the global civilian market. According to national space policy in 2011, "the United States shall provide continuous worldwide access, for peaceful civil uses, to the Global Positioning System (GPS) and its government-provided augmentations, free of direct user charges."²⁶ For intra-state cooperation, "the United States shall engage with foreign GNSS providers to encourage compatibility and interoperability, promote transparency in civil service provision, and enable market access for U.S. industry." Similarly, Compass's "open" service, which is free of charge to global users, will have positioning accuracy of 10 meters, while "authorized service" is for users demanding high-accuracy service.²⁷ However, this intention has not been formally absorbed by any policy issued from the national level. Actually, Galileo has been expected to provide a different example on regulating GNSS.²⁸ To the extent that these two new GNSS constellations involve a race for customers' dollars—and the Europeans have emphasised the profit-making potential they see in Galileo—it's now clear that the Chinese are moving much faster.²⁹

What's more, how would China conduct bilateral talks with other countries owning GNSS system? China's policy on Compass is still vague so that external observers could only speculate from the comments made by officials on occasions like the successful launch of Compass satellites and bilateral negotiations with U.S. To some extent, it makes the international cooperation difficult and unstable.

Technical cooperation for signal compatibility and interoperability is the issue to be put on agenda first. In 2010, U.S. sought bilateral talks with China on GNSS.

Until now, discussions of the subject between the two countries has taken place almost exclusively in multilateral forums, such as the United Nations-supported International Committee on GNSS (ICG), the Asia Pacific Economic Cooperation GNSS Implementation Team (APEC-GIT), and the operator-to-operator frequency coordination under the auspices of the International Telecommunications Union (ITU).³⁰ In several NaviForum panel sessions, a Chinese official emphasized the government's desire to promote Compass and its applications.³¹ The Compass project management center would encourage Chinese entrepreneurs and provide technical support as well as support for the drafting of appropriate policies and regulations to create a stable framework for Compass development.³²

Another issue is to negotiate the frequency use with E.U. on the frequencies that both Galileo and Compass plan to use in the future. Compass proposes to use frequencies planned for Galileo's Public Regulated Service (PRS)--and for the GPS military code--meaning that in an emergency, Europe could not jam the Chinese signal without also jamming its own encrypted, security-related signals as well.³³ International Telecommunication Union provides a platform for Member states to discuss such matter. Bilateral talks in 2010 did not produce any substantial outcome. The thorniest topics confronting European and Chinese negotiators are similar to those that threatened to scuttle collaboration between the U.S. GPS navigation system and Europe's Galileo constellation, now in development.³⁴ China represents only one of those Galileo partnerships, but arguably the most strategic of them.³⁵ U.S. also keep a close eye on China-E.U negotiation. If Europe is forced to accept China's overlap of

Galileo's PRS service, European officials may be tempted to move PRS to another frequency.³⁶ But doing so will be difficult and would almost certainly require a re-opening of the U.S.-European agreement reached in 2004, according to Michael E. Shaw, director of the U.S. National Space-Based Positioning, Navigation and Timing Office.³⁷ Trilateral talk has not been conducted so far, and especially given that Galileo encountered financial difficult, it cannot be expected in the recent one or two years. Availability of a competing GNSS service would apply considerable pressure on the existing primary GNSS provider, the United States.³⁸ Once it was expected that Galileo would be the push, but now, Compass presents a more promising picture.

III NATIONAL POLICY AND REGULATION OF COMPASS

The specialty of GNSS regulation is that policy always comes first. National Development and Reform Commission COSTIND (Commission on Science , Technology , and Industry for National Defense) jointly issued the document entitled "Several Opinions Regarding Promotion of the Industry of Satellite Applications". It mentions that, to "speed up establishment of the Compass-based civil navigation industry; and set up coordination mechanism and make study on policy of civil use of Compass."³⁹ This document was hardly mentioned in international studies on GNSS, especially those having doubts over the possible civil use of Compass. GNSS is the first international market that Chinese space programs have ever been linked to. So it is time for China to modernize its policy and rules of Compass. The future policy should solve the concerns regards the free-charge of service and the inclination for international cooperation.

The national space policy carries far more implications for China's position in the international forum. The possible drafting of treaty on GNSS third party liability is a case in point. The international instrument on third party liability for GNSS service was put on the working agenda of UNIDROIT, and national laws and policies would help China to voice its concern as a perspective stakeholder either in multilateral negotiations or bilateral talks with service user country.

For the liability issue, U.S. has emphasized on many occasions that since GPS provides service free of charge, it will not subject itself to any liability claim or regime. How should China formulate its strategy for the drafting of the Convention on Third Party Liability for Global Navigation Satellite Systems (GNSS) Services.⁴⁰ The convention drafting is not the central issue of this paper. Nevertheless, to bring the service provider into the liability regime, the authors think it would be necessary to bring those countries around the table for the multilateral negotiation so as to reach basic consensus.

China is at the crossroad for space commercialization and privatization. The absence of an appropriate authority for the civilian use of Compass has caused substantial difficulty for the planning on applications, policy study, market management, national management of satellite navigation.⁴¹ It not only affects the popularity of Compass, but also the industrialization of satellite navigation.⁴² So the pressing issue is to clarify the duties of each department and eventually procure the central authority for the civil applications of Compass. It is possible to refer to U.S. model. The GPS System is operated by DOD but since 1996 has been managed by Interagency GPS Executive Board (IGEB), chaired jointly by DOD and DOT with

membership including the Departments of State, Commerce, Interior, Agriculture, and Justice, as well as NASA and the Joint Chiefs of Staff.⁴³

IV CONCLUSION

Compass presents a promising prospect in the future GNSS market. To keep pace with technology progress so far achieved, China should clarify its intention to develop the civil use aspect of Compass in the first place. More concrete national space policy should be taken into consideration. What's more, to better cooperate with other GNSS operators from technological perspective and also compete in the global market from the commercial perspective, China should identify the right authorities to carry different functions and play a more active role in the international stage as a rule maker.

¹ Volker Liebig, and Kai-Uwe Schrogl, *Space Applications and Policies for the New Century: The Impact of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) 1999*, Peter Lang Pub Inc (December 2000), p 126.

² International Negotiations Concerning the Global Positioning System, 2000 (28) *Journal of Space Law* 155-162.

³ Robert Lorimer, and Eric Gakstatter, POSITION REPORT GNSS Market Research and Analysis - GNSS Precise Positioning Market Report 2008-2012, Abstract - September 2008 <http://images.questex.com/GPSW/2008/GPSW_Daily/POSITION_REPORT_Abstract_Sep08.pdf>

⁴ Major Elizabeth Seebode Waldrop, *Integration of Military and Civilian Space Assets: Legal and National Security Implications*, (2004) *The Air Force Law Review* 157-230

⁵ *Ibid.*

⁶ Alanna Krolkowski, *China's Civil and Commercial Space Activities and their Implications* Testimony before the U.S.-China Economic and Security Review Commission Hearing on the "Implications of China's Military and Civil Space Programs",

<http://www.gwu.edu/~spi/assets/docs/11_05_11_krolkowski_testimony.pdf>

⁷ *Ibid.*

⁸ White Paper on China's Space Activities in 2006

http://www.gov.cn/ztl/zghk50/content_419652.htm

⁹ China launches ninth orbiter for indigenous global navigation system http://news.xinhuanet.com/english2010/sci/2011-07/27/c_131011502_4.htm

¹⁰ CNSA website.

¹¹ China Sent the Eighth Compass Satellite to the Planned Orbit,

<http://www.cnsa.gov.cn/n1081/n7499/n314880/n331828/339127.html> last visited

¹² Ibid.

¹³ Ibid.

¹⁴ Peter B. de Selding, European Officials Poised To Remove Chinese Payloads From Galileo Sats <http://www.spacenews.com/policy/100312-officials-poised-remove-chinese-payloads-galileo.html>

¹⁵ Ibid.

¹⁶ See supra note 1, p 97.

¹⁷ Chinese Square Off With Europe in Space <http://query.nytimes.com/gst/fullpage.html?res=9503E1DF153BF930A15750C0A96F9C8B63&pagewanted=2>

¹⁸ Ibid.

¹⁹ Stephanie Wan, Global navigation satellite system: GNSS Interference - The debate rages on Publish Date: 19 August 2011

<http://www.geospatialworld.net/index.php?option=com_content&view=article&id=22876>

²⁰ Ibid.

²¹ See supra note 6.

²² 2010 and beyond: China's space program (January 3, 2010)

<<http://yolearnchinese.com/archives/2010-and-beyond-chinas-space-program>>

²³ China enters GNSS Scene, Kerville's MovingDirt Magazine, p 18.

²⁴ Ibid.

²⁵ Ibid.

²⁶ National Space Policy of the United States of America June 28, 2010

²⁷ Compass Will Cover Asia-Pacific by 2012, <http://news.xinhuanet.com/mil/2010-03/03/content_13087844.htm>

²⁸ See supra note 23.

²⁹ Ibid.

³⁰ Glen Gibbons, NaviForum Shanghai: U.S. Seeks Bilateral Talks with China on GNSS (September 9, 2010)

<<http://www.insidegnss.com/node/2309>>

³¹ Ibid.

³² Ibid.

³³ Galileo, Compass on collision course, (April, 2008)

<http://findarticles.com/p/articles/mi_m0BPW/is_4_19/ai_n25432193/>

³⁴ Peter B de Selding, Europe, China Remain at Odds over Navigation Systems <http://www.spacenews.com/civil/europe-china-main-odds-over-navigation-systems.html>

³⁵ Galileo: Coping with Change, China, and Challenges January/February 2007

<<http://www.insidegnss.com/node/100>>

³⁶ See supra note 34.

³⁷ Ibid.

³⁸ Paul B. Larsen, 2001 (17) Space Policy, 111-119.

³⁹ Several Opinions Regarding Promotion of the Industry of Satellite Applications

<http://www.sdpc.gov.cn/zcfb/zcfbtz/2007tongzhi/t20071123_174233.htm>

⁴⁰ The Council took note of reiterated expressions of interest in the project and encouraged the Secretariat to continue its consultations with representatives of interested Governments, international Organisations, industry and other stakeholders, with a view to ascertaining the level of potential support for the project, defining its possible scope and clarifying its essential features.

⁴¹ Chen Jiancheng, The Development of Compass Depends on Government Policy, (April 28, 2008)

<<http://www.cnsa.gov.cn/n1081/n7619/n7875/4066.html>>

⁴² Ibid.

⁴³ See supra note 4.