

Czech industry in space R&D

In the context of the symposium

„Role of Industry in Space Exploration“

COPUOS

Scientific & Technical
Subcommittee

53rd session

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Czech industry in space R&D



Prague, Czech Republic



GSA HQ since 2012



**Full member
since 2008**



Since 2004



Czech personalities in OOSA and COPUOS

- Dr. Kopal had been the world authority on space law
 - Chairman of COPUOS Legal Subcommittee 1999-2003 and 2008-2009
- Dr. Perek (now 97 years old), astronomer
 - General Secretary of IAU 1967-1970
 - Chief, Outer Space Affairs Division, New York 1975-1980





History

- Prague had been the centre of space research and learning since Tycho de Brahe and Kepler worked for the Bohemian King & Roman Emperor Rudolf II
- Czech scientist & engineers contributed key subsystems to all Intersputnik missions, e.g. the stabilised platform for the Vega mission to Venus
- Czech was the third national to fly to space after the Russians and the Americans

BUT in the modern times we needed to get away from,

- pure science, party politics, propaganda goals



Change from science and party politics driven R&D, to practical, sustainable & commercially viable R&D

- After gaining independence from the Soviet Union in 1989, most of space R&D went into low gear, only science goals
- **CHANGE → 2005 start of PECS programme**, as transition to ESA membership, brought **substantial change of approach** - and partially painful
- Czech Republic raised to the challenge & was by far the fastest graduate of the PECS programme from all new EU member states – whilst the minimum period was 5 years, we were ready for accession to the ESA convention after mere 3 years



Czech industry associated in the Czech Space Alliance

- **the change led to development of space industry**
- **Czech Space Alliance established in 2006**
- 16 SMEs and associated larger companies
- **Internal goals** – lobbies for interests of members with respect to the government stakeholders; contributes to the National Space Plan
- **External goals** – presents the skills of Czech space abroad, develops contacts with industry and agencies worldwide
- Publishes catalogues through Ministry of Transport, CzechTrade, and in the European Space Directory



Czech Space Alliance with other trade associations

- **2007** CSA co-founded the pan-European association of national SME associations **SME4space**
- Through SME4space it has communication channels to Eurospace and in its turn to ESA industrial policy



SME4SPACE



CSA in the ESA transition programme PECS (2005-2008)

- satellite Navigation EGNOS & SISNeT
- GRID technology in EO/SAR
- set up & operation of the 1st CEE EGNOS monitoring station
- ESA study of space SME needs in PECS countries
- SCOS-2000 TT&C Extension & Mission Control System Demo.
- navigation Educational Tools for ESA GNSS
- spatial Observation Services & Infrastructure in CZ (SOSI-CZ)
- Image Info. Mining in Time Series (1st int'l. competitive tender)
- development of novel X-ray optical subsystems



Some CSA successes in ESA's int'l. tenders

- **1st win** - EO - AO5119 “Image Information Mining in Time Series” with ACS Italy
- GNSS - AO6149 “Interference Monitoring for GNSS Reference stations” with Astrium Germany
- AO10125 MTG Data Collection System & GEOSAR
- SSA/GSTP - AO6767 “Test-Bed of an Autonomous Follow-Up Telescope”; ISDEFE Spain
- AO70154 Solar Orbiter Power SCOE



Other sample projects not under direct ESA contract

- Galileo search & rescue, Indra consortium for GJU
- ESA SWARM mission μ -accelerometer : experiment flight software & electronics including CSA members CSRC and Evolvesys
- IRIS / Antares – EU satellite communications system for civilian air-traffic, subcontracted to Thales/INDRA, including CSA – Evolvesys, Iguassu Software Systems



CSA successes in commercial project

IRIDIUM NEXT

“Solar Panel Deployment Mechanism”

Frentech through TAS France

TAS France SBAS Real-time Monitoring System
product EVORA, Iguassu

TAS France Several projects for Composite tape
spring development – 5M



ESA advises industry to develop **space business globally**

CSA is most active in developing relationship in :

ESA member states - e.g. A, F, D, I, NL, ES, UK, Poland, Estonia, Hungary...

ESA candidate member states – Latvia, Slovakia

Overseas – Brazil AEB/INPE, Japan JAXA/SJAC/Jaspa, Argentina CONAE, Chile, Mexico, GISTDA Thailand, UAE,

...





International agreements



- “Letter of intent” with the Brazilian Space Agency
- drafted and negotiated by the CSA
- signed by Brazilian Space Agency (AEB) President and the Czech Minister of Transport





LOI with the Brazilian space agency



After the LOI signature Czechinvest & CSA organised

“Czech Brazilian Space Industry Days”

with presentations for :

AEB in Brasilia,

INPE in S. J. Dos Campos,

CTA in S. J. Dos Campos

Air-force in Alcantara launch base

2013 & 2015 – Space Technology

Mission





Outside of ESA



- co-operation MOU between CSA and the association of Japanese SMEs JASPA/Manten
- signed 2010 at the Czechinvest event “Czech Japan Technology Day”
- High level meetings with JAXA and Office of National Space Policy 2012, 2013, 2014, 2015





Japan



- Meetings with the JAXA presidents Mr. Tachikawa and now Mr. Okumura
- MOU recently drafted by the Czech Ministry of Transport
- Good rapport with space industry including NEC Space, MELCO,.. and, of course, SJAC
- In Oct. 2016 a Czech stand at the Japan Aerospace exhibition





Japan



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【HEADLINE NEWS】

★チェコ宇宙産業会長に聞く、拡大するチェコ宇宙産業 ESA拠出金、今後数年で現在比“倍”も

チェコ宇宙産業連盟のピーター・バレスシュ会長が来日して、このほど本紙のインタビューに応じた。バレスシュ会長によれば、チェコの運輸交通省では国家宇宙開発計画が4年前に策定され、現在その新しい版を出す準備作業を進めている。「4年前、チェコの欧州宇宙機関(ESA)に対する拠出金は800万~900万ユーロだった。しかし、現在では1500万ユーロの規模まで膨らんだ。これはチェコ政府が宇宙産業のイノベーションによる競争力強化に投資することの重要性を認識したため」であることを強調した。その上で、「今後数年間で3000万ユーロまで引き上げたい」と話し、



チェコ宇宙産業のピーター・バレスシュ会長(左)とチェコインベストノヴァーコヴァー・エリシカ駐日代表

は、日本の中小企業コンソーシアム『まんでんプロジェクト』と2010年に連携に向けた覚書に調印している。

宇宙産業に限らなければチェコ国内には日本の企業の存在感が高まりをみせていて、チェコインベスト(ビジネス・投資開発庁)によれば、すでに日本企業228社がチェコに製造拠点ないし事務所など営業拠点等を構えている様相だ(うち製造拠点を構えている日系企業は96社)。

チェコインベストのノヴァーコヴァー・エリシカ駐日代表によれば、チェコが東西両方の欧州に優れたアクセスを提供する立地にあることのほか、熟練した高い技術を有する労働者を比較的安いコストで雇用できること、そして事業を展開するうえで重要な要素である政情および金融セクターが安定していることから、日本企業の進出が拡大しているとの認識を示している。

バレスシュ会長はチェコ宇宙産業においても、航空宇宙産業で存在感を示す京セラグループのAVX、さらにはX線関係に強みを持



CSA members - potential areas of cooperation (1)

- **AVX** - world's No. 1 tantalum and niobium capacitor manufacturer (Japanese parent KYOCERA )
- **BBT** – crystal optics for infrared region, polarizers, scramblers, acousto-optics, hyper-spectral imaging
- **CSRC** – space electronics including h/w & s/w design, clean room manufacturing, ESA certification
- **EGGO Space** – passive electronic components test facility
- **Evolvsys** – flight s/w for payloads & data processing





CSA members - potential areas of cooperation (2)

- **Frentech** – precision mechanical assemblies manufacture (space mechanism and subsystems) for satellites and thermal testing
- **Iguassu Software Systems** – satellite navigation, SBAS, EO processing, EGSE, satcom, studies, SSA
- **LK Engineering** - industrial engineering, consulting, advanced computational technologies
- **RIGAKU** – R&D, world class precision X-ray optics 
- **Siemens** – software : EGSE, S2K MCS, GS, satcom, EO data management. 



CSA members (3)

- **SYNPO** – advanced material R&D, e.g. ESA epoxy core development
- **TOSEDA** – nanocomposite materials R&D and production
- **5M** – development & production of composite materials and adhesives
- **Sobriety** – Computational Fluid Dynamics, computer vision applications, design of Self-deployable Habitat for Extreme Environments



CSA members (4)

- **Chipinvest** – diagnostics & microsystems
- **BD Sensors** – electronic pressure sensors, transmitters and switches technologies



Summary of principal CSA competences

- Precise mechanical subassemblies
- Space qualified electronic subsystems
- Engineering consultancy
- Passive electronics
- Advanced materials development
- Software systems, especially
 - Satellite positioning (GNSS/SBAS/EGNOS)
 - Mission and control systems
 - Real-time on-board and ground segment software
 - Earth observation
 - EGSE



Space Coordination Council of the Minister of Transport

- In 2010 the council was appointed by the government to develop and implement the Czech space policy, to represent the Czech Republic in ESA and other international bodies such as EU
- There is currently **NO national space agency nor any official national “space office”!**
- The space policy is being defined in strategic documents, drafted in collaboration with all space stakeholders, including the Czech Space Alliance



National Space Plan 2010

- Prepared by ministries, Czech Space Office, industry, ESA
- 6 measurable goals to be fulfilled by 2016
- ALL FULFILLED by 2014 😊

National Space Plan 2014 - 2019

- Prepared by ministries, industry, ESA
- More ambitious goals
- Justification for ESA budget increase for the next period
- Download from
www.czechspaceportal.cz/files/files/NSP_2014_2019_ENG.pdf



Conclusion

The Czech Republic www.czechspaceportal.cz/en/ progressed rapidly to the full ESA membership, developed competitive industry

- measurable goals for the original National Space Plan have all been fulfilled
- new goals set out in the 2014 – 2019 Space Plan

The Czech industry association www.czechspace.EU

- won over scores of space projects since 2005 incl. Galileo and other international tenders, and developed partnership with major European space companies



Thank you for your attention

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