**CARBON DIOXIDE - MONITORING MISSION IN DEVELOPMENT**

**A-Roll**

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| Image | Text |
| 10:00:00:00 | **TITLE: CARBON DIOXIDE MONITORING MISSION IN DEVELOPMENT** |
| 10:00:08:00 * VO
* Images of Copernicus mission
* CO2 monitoring satellite

 | **To address the climate crisis, reducing greenhouse gas emissions is imperative. One of the Copernicus Sentinel Expansion missions, led by the European Commission, will play a critical role in tracking the amount of carbon dioxide in the atmosphere.** **This is the Copernicus anthropogenic carbon dioxide monitoring mission, or CO2M for short. The mission currently comprises two satellites, each carrying near-infrared and shortwave-infrared spectrometer to measure atmospheric carbon dioxide at high spatial resolution.** |
| 10:00:40:00* BROLL TSESO Aix-en-Provence, France
* BROLL TSESO Aix-en-Provence, FRANCE
 | **Today we are at THALES SESO a large precision optics and systems manufacturer in Aix en Provence, France, to see how the development of some of the measuring and optical components is going. With a wealth of experience in high-end state-of-the-art precision devices they are the perfect partner to produce the exacting components for observations from space.****Let’s meet some of the team who can tell us more about the project.** |
| 10:02:05:22* TSESO Aix-en-Provence, FRANCE
 | **Yannig Durand, CO2M Payload Manager**CO2M will be the first satellite to measure the greenhouse gas emission. Of course, CO2 or methane has already been measured in the past. Since it started 20 years ago, but to measure the human made part of it is really the difficult part. And this we have to realize it is a measurement of one particle of CO2 on the very large background of 400 particle of CO2 per million particles of air. So this is extremely difficult to have this measurement done and CO2, it will be doing it for the first time. |
| 10:01:50:06* 10:02:55:02
* TSESO Aix-en-Provence, FRANCE
 | **Gilles Bonnetto, TAS-F Cannes Deputy CO2M Payload Manager**ThalesAlenia space will deliver to HB 2 CO2M payloads based on the modular architecture and design to build around three instruments for each payload. The first one is a combined CO2 instrument based on the visible and infrared spectrometers, provided by ThalesAlenia space France. The second one is a multiangle polarimeter, which is called MAP. Based on four identical cameras contained in a dedicated optical unit provided by ThalesAlenia space in the United Kingdom. Part of the challenge is that the CO2M payload will simultaneously be able to deliver highly accurate quotative measurements of CO2 and AN02 but also measurements of aerosol density and cloud detection and mapping. Thereby this will ensure the maximum accuracy of error correction of the measurement in CO2 concentration. **Christophe Rahmouni, TSESO Local CO2M program Manager**THALES SESO is the designer and the manufacturer for five subsystems of the spectrometer. So we are working on collimeter mirrrors, objectives. also called imagers, light splitter, also called dichroic visible prisms, visible on near-infrared detector assemblies. |
| 10:03:15:00* Optical measurement room
* TSESO Aix-en-Provence, FRANCE
 | **The mirrors inside the spectrometers need to have extremely precise, reflective properties. The five manufacturing steps of milling, grinding, lightning polishing and coating has to be carefully completed. The stringent measurement controls applied at each level of the production.** |
| 10:03:33:00* Optical measurement room
* TSESO Aix-en-Provence, FRANCE
 | **Christophe Rahmouni, TSESO Local CO2M program Manager**This is the last control before final polishing. So we have here a nolographic control that will allow you to get a map, a cartography of the last defects before. ion beam polishing it. So the interferometric measurement allows us to see fringes of of the mirrors permitting the detection of the defects. |
| 10:04:03:12* TSESO Aix-en-Provence, FRANCE
 | **Christophe Rahmouni, TSESO Local CO2M program Manager**In terms of manufacturing. Several challenges need to be managed.The first challenge is polishing, mainly mirror polishing. The polishing accuracy is very tight. What we are doing basically is we are removing defects on surface with a precision equivalent of the hair on a football stadium. On top of that, we are not on a flat surface. But on a very compact geometry named Freeform. |
| 10:04:30:09* Animated satellite sequence
 | **The CO2M mission will improve estimates of emissions of carbon dioxide from human activity.****This will provide the EU with a unique and independent source of information to assess the effectiveness of policy measures to reduce emissions and decarbonising Europe.** |
| 10:04:48:20 | **ESA OUTRO** |
| 10:04:58:11 | **END** |