



GORE NewSpace

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Ron Leary
Engineer, USA
Duncan Murchie

Application
Application Engineer, UK



GORE NewSpace



Breaking Through the Barriers

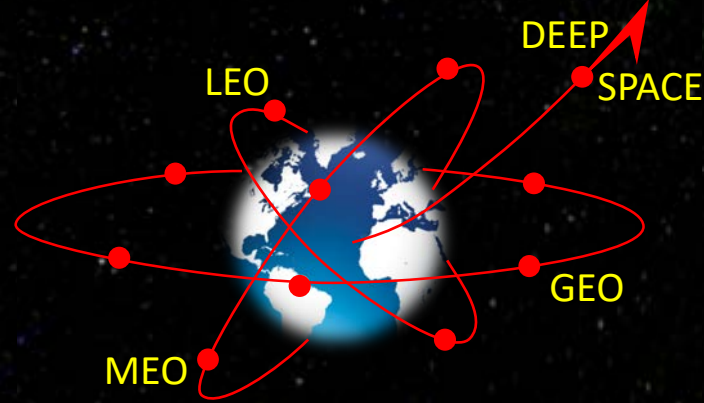
GORE Traditional Space Portfolio

GORE for over 50+ years has provided NASA and ESA for launch and flight projects with Grade/Class 1 and TRL status 6+ Cable and RF Assemblies

GORE NewSpace



GORE NewSpace Products Technical Readiness Level



GORE NewSpace TRL Status 6+

GORE NewSpace TRL Status 6+

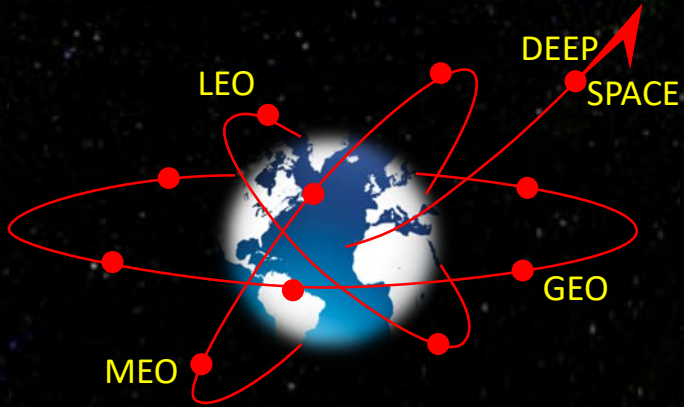


TRL 8 System complete and "flight qualified" through test and demonstration

TRL 7 system prototype demonstration in a space environment

TRL 6 System/subsystem model or prototype demonstrated in a relevant environment

EEE-INST-002 Level 2



Inst
Scre

5.2 Other Part Types

Part types that do not fall into one of the preceding categories listed in paragraph 5.1 shall be reviewed on a case-by-case basis using the closest NASA, DSCC or government controlled specification as a baseline. The review shall ensure that parts meet the reliability requirements of its intended space flight application and shall cover the selection, screening, qualification and applicable derating. In the event a suitable government baseline specification does not exist, the user shall approach the project parts engineer to identify the parts expert who can provide information on the best available industry standards to develop procurement specifications that meet the reliability goals.

6.0 INSTRUCTIONS

EEE parts shall be processed in accordance with the detailed requirements for the applicable part types and quality levels specified in Sections C1 through W1. Each section contains selection, screening, qualification, and derating tables. All tests shall be performed in the order shown unless otherwise approved by the project. Exceptions or additions to the requirements specified in any section shall be defined in the project MARs document. Applicable part quality levels shall be as defined by the project in the MARs. As a guide to project managers, decision leaders and System Assurance Managers (SAMs)

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erating

Low Risk



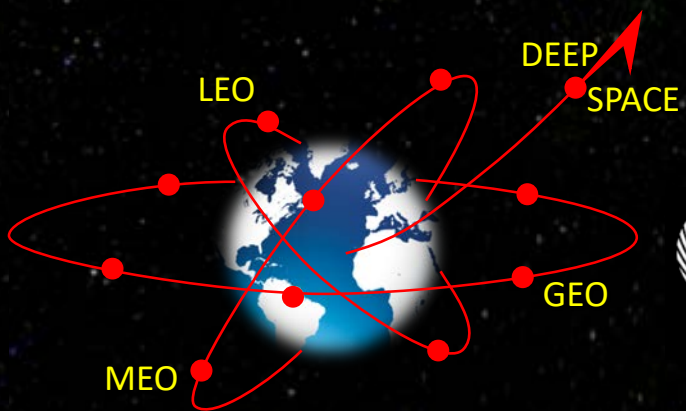
Cost Effective

Level 2: Parts shall be selected and processed to this level for missions with *low to moderate risk*, *balanced by cost constraints* and mission objectives. Level 2 active parts shall be reviewed for radiation hardness, and radiation testing is required when information is not available. The typical mission duration for level 2 *programs varies from 1 to 5 years.*

the data on any particular LDC not applicable to another LDC. *Level 3 parts are intended for mission applications where the use of high-risk parts is acceptable.* Level 3 active parts shall be evaluated for radiation hardness, and radiation testing is required when information is not available. The typical mission duration for level 3 programs varies from less than 1 year to 2 years.

6.1 Parts Control Boards (PCBs)

When PCBs are required by the project MAR or implemented by the contractor or developer, the PCB shall review all parts for compliance to established criteria. Review information shall include specifications, screening and qualification plans, supporting data, and application requirements required to determine acceptability.



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ECSS-Q-ST-60-13C Annex G Class 3



Space p
electric
electron

Commercial
ponents

ECSS-Q-ST-60-13C
21 October 2013

**Annex G (informative)
Difference between the three classes**

	CLASS 1	CLASS 2	CLASS 3
EVALUATION	COMPLETE Construction analysis Electrical check: 5T+12°C margin Mech shocks + Vib. + Correl. Acc. (for cavity package) Preload + HAST 96h or THB 1000h Load 2000-120°C + 50h Preload + 500°C-55°C+120°C Radiation evaluation (TD, SEE)	COMPLETE Construction analysis Electrical check: 5T+12°C margin Mech shocks + Vib. + Correl. Acc. (for cavity package) Preload + HAST 96h or THB 1000h Load 2000-120°C + 50h Preload + 500°C-55°C+120°C Radiation evaluation (TD, SEE)	LIMITED Construction analysis Radiation evaluation (TD, SEE)
JD (Justification Doc)	DATA COLLECTION Component manufacturer data Approval status Evaluation tests Procurement inspection and test Lot acceptance tests Radiation hardness data and RVT	DATA COLLECTION Component manufacturer data Approval status Evaluation tests Procurement inspection and test Lot acceptance tests Radiation hardness data and RVT DATA COLLECTED (if used for lot test reduction)	DATA COLLECTION Component manufacturer data Approval status Evaluation tests Procurement inspection and tests Lot acceptance tests Radiation hardness data and RVT DATA COLLECTED (if used for lot test reduction)
CUSTOMER PRECAP.	no	no	no
SCREENING	COMPLETE X-ray Sensitization -10°C-55°C+120°C PIND test (if applicable) Initial electrical test @ 25°C Dynamic burn-in 240h-25°C Final electrical test @ 3T PCA (5%) Hermeticity (if applicable) External visual inspection	LIMITED (if data collected) PIND test (if applicable) Hermeticity (if applicable) * If no data collected (see JD) Sensitization -10°C-55°C+120°C Initial electrical test @ 25°C Dynamic burn-in 100h+120°C Final electrical test @ 3T PCA (5%) External visual inspection	LIMITED PIND test (if applicable) Hermeticity (if applicable)
TEST (for screened parts) (when applicable)	COMPLETE Construction analysis Mech shocks + Vib. + Correl. Acc. (for cavity package) Preload + HAST 96h or THB 1000h Load 2000-120°C Preload + 500°C-55°C+120°C RVT (Radiation Verification test)	COMPLETE (incl. LT (if applicable)) Construction analysis Mech shocks + Vib. + Correl. Acc. (for cavity package) Preload + HAST 96h or THB 1000h Load 2000-120°C Preload + 500°C-55°C+120°C (may be waived i.a.w. applicator) RVT (Radiation Verification test)	LIMITED (if data collected) Construction analysis RVT (Radiation Verification test) * If no data collected (see JD) Load 1000-120°C Preload + 500°C-55°C+120°C
CUSTOMER BUY-OFF	no (replaced by incoming)	no (replaced by incoming)	no (replaced by incoming)
INCOMING	yes	yes	yes

LIMITED
- Construction analysis
- Radiation evaluation (TID, SEE)

Limited Evaluation

LIMITED
- PIND test (if applicable)
- Hermeticity (if applicable)

Limited Screening

DATA COLLECTED
(lifetest, HAST, thermal cycling)
used for lot test reduction

Minimized Data

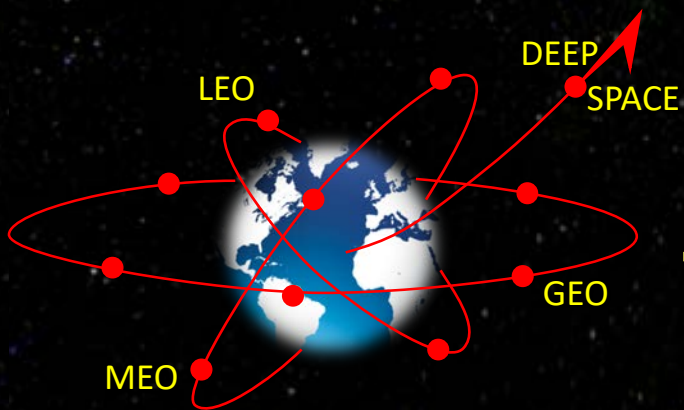
LIMITED (if data collected)
- Construction analysis
- RVT (Radiation Verification test)

Limited Lot Test



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Technology Pathway Forward



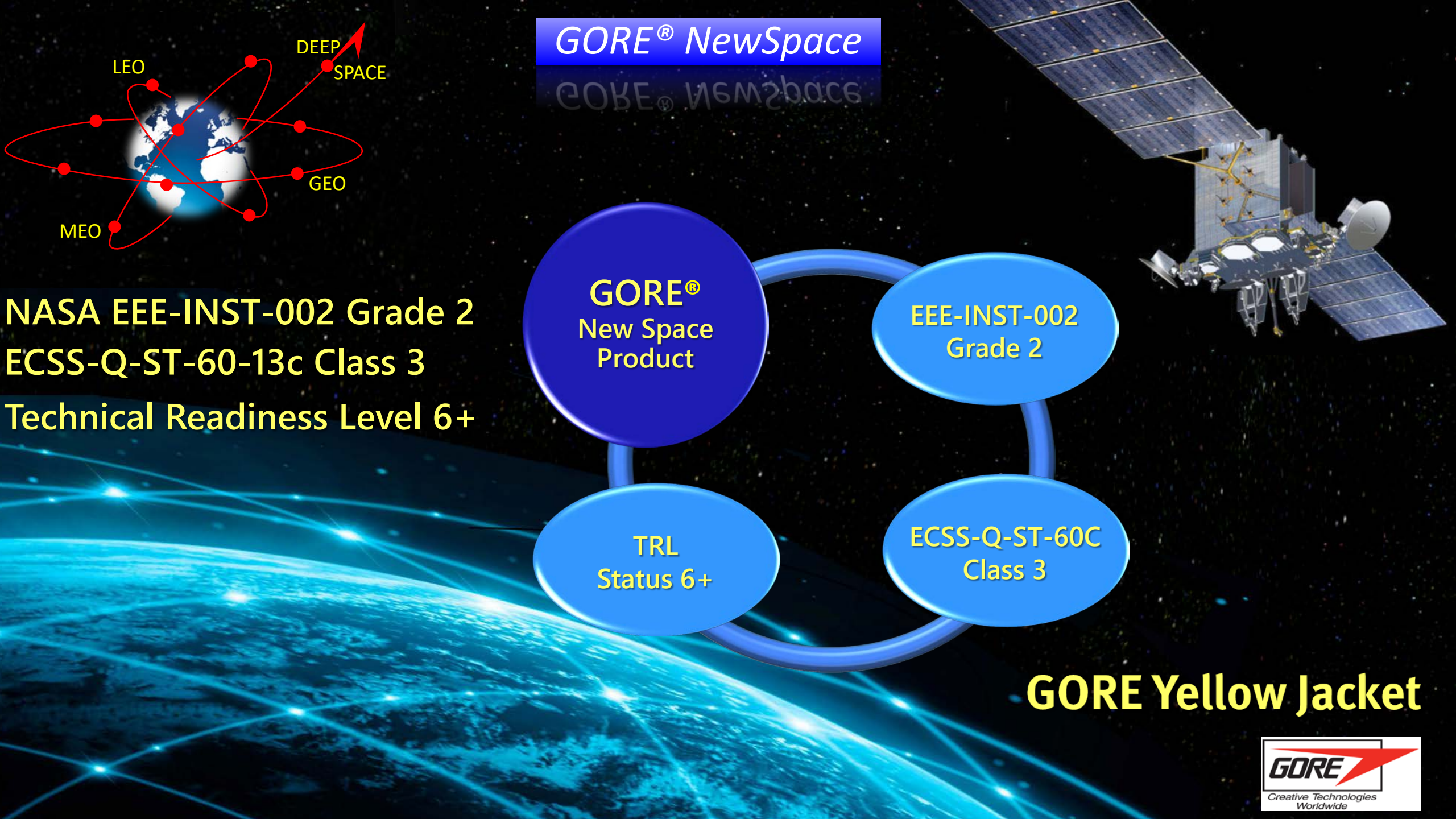
~~Appropriately Scoping~~

Harmonizing efforts between the private sector and NASA / ESA / JAXA

GORE has developed a EEE-INST-002 Level 2 / ECSS-Q-ST-60 Class 3
Portfolio
for
NewSpace & Launcher Systems

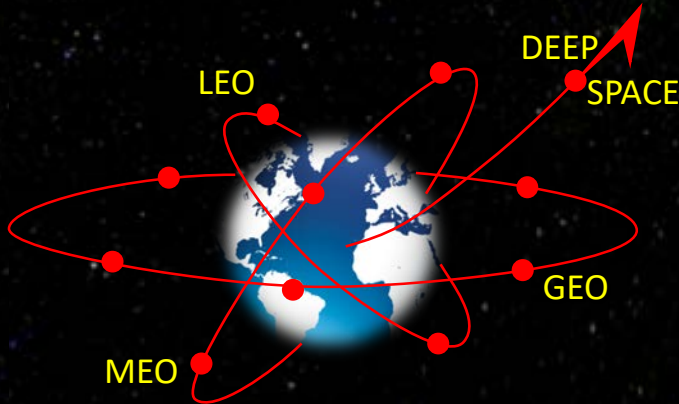
GORE Yellow Jacket



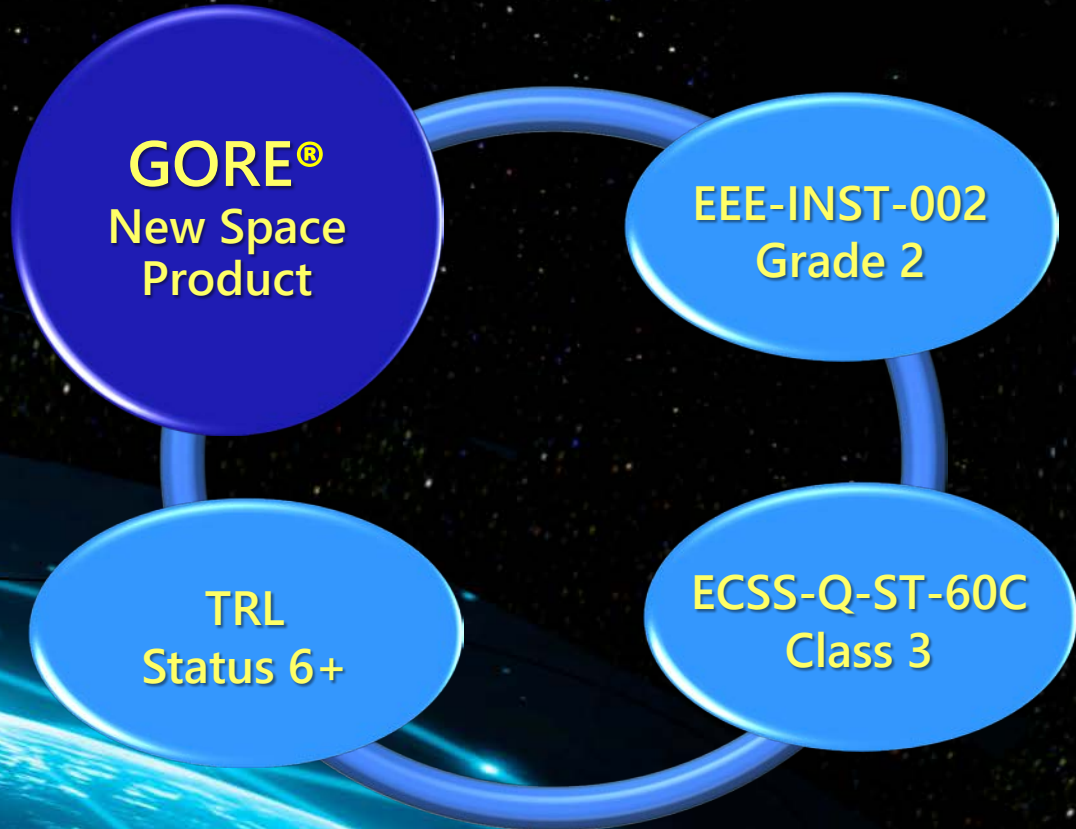


GORE® NewSpace

GORE® NewSpace



NASA EEE-INST-002 Grade 2
ECSS-Q-ST-60-13c Class 3
Technical Readiness Level 6+

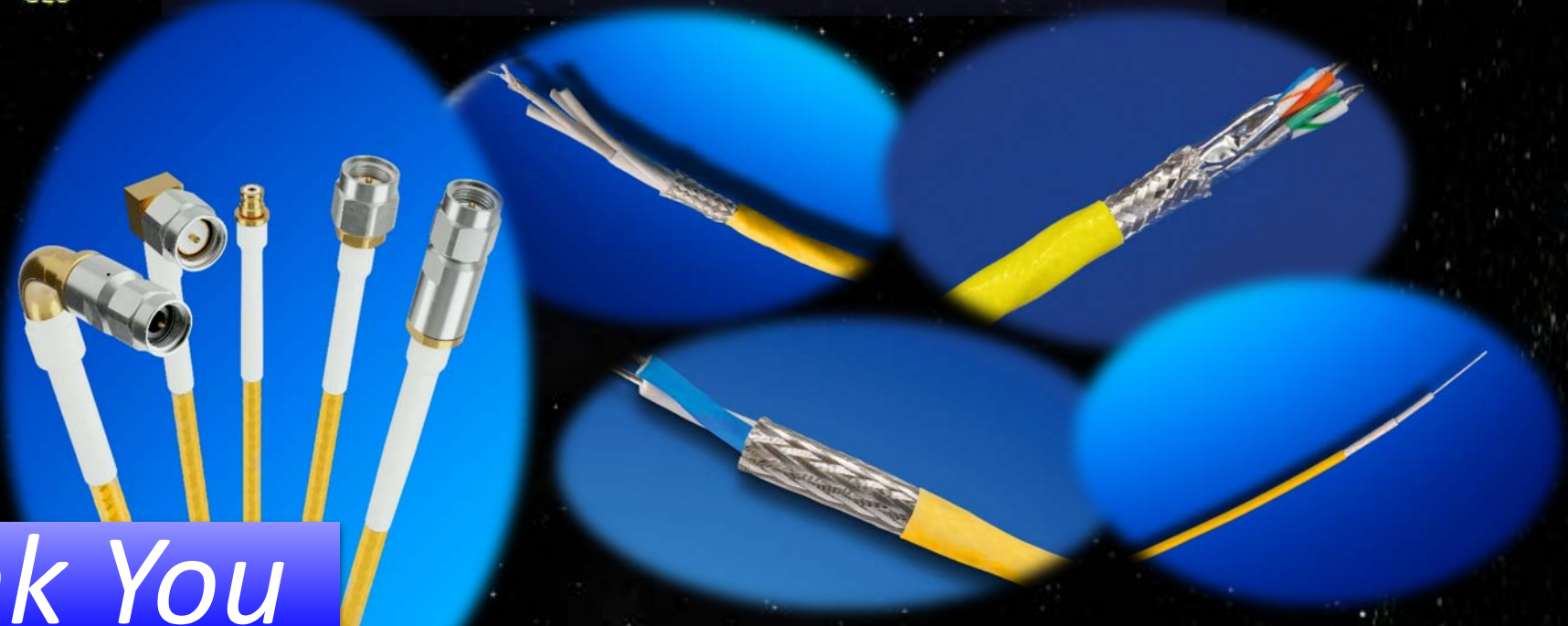


GORE Yellow Jacket





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Thank You

GORE NewSpace & Launcher Systems Portfolio with Yellow Jacket
EEE-INST-002 Level 2 / ECSS-Q-ST-60-13C Class 3

Ron Leary
Engineer, USA
Duncan Murchie

Application
Application Engineer, UK

