APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

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Component Title: Relays, latching, Type EL415

Appl. No. 98K

Executive Member: CNES Date: 02/05/2022

1 Components (including series and families) submitted for Extension of Qualification Approval:

ESCC COMPONENT NO.	VARIANTS	RANGE OF COMPONENTS	BASED ON	TEST VEHICLE / S	COMPONENT SIMILAR
3602 004	04,06, 09, 14, 16 and 19	Coil Voltage : 12 and 28 V	Type EL415	3602 004 06 28V	All variants

2 Component Manufacturer
REL-STPI

3 Location of Manufacturing Plant(s)
22, rue des chaises
45140 St Jean de la Ruelle - France

4 Date of original qualification approval:
Date: 01/11/1982

Certificate Ref No. 98

5 ESCC Specifications used for Maintenance of qualification testing:
Generic: 3602 Issue: 4
Detail(s): 3602 004 Issue:

6 Deviations to LVT testing and Detail Specification used:
No ☒ Yes ☐ (supply details in Box 15)
Deviation from current Specifications:
No ☒ Yes ☐ (Supply details)

7 Qualification Extension Report reference and date:
3754.10.21 Rapport Essais VOQ EL415, 22/12/2021
3769.03.21 Essai Périodique EL415, 31/05/2022
DC 227-20, 15/12/2020 Dossier de Contrôle LVT 3
DC 51-21, 23/06/2021 Dossier de Contrôle LVT 3

8 Summary of procurement or equivalent test results during current validity period in support of this application (those to ESCC listed first)

Project Name	Testing Level	LAT	Date code	Quantity Delivered
See Files : Data livraisons EL 4 2013-2022 -MAJ 16032022				

9 **PID** changes since start of qualification
None ☐
Minor* ☒
Major* ☐
*Provide details in box: 19

10 Current **PID** Verified by: J-P.Bussenot,CNES
Name of Excutive Representative
Ref No: PID EL415
Issue: R Date: 07/04/2022
Rev Date: 16/03/2022

11 Current Manufacturing facilities surveyed by: D.Lacombe,ESA and B.Marty CNES on 14/09/2016
(Name of Executive Representative) (Date)

Satisfactory: Yes ☒ No ☐ Explain

Report Reference: ESCC-AUD-RELF2016-01 (September 2016)

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Failure Analysis, DPA, NCCS available: Yes ☒ No ☐ (Supply data)

Ref. No's and purposes: 2CREL103: particles on E & EL relays contacts : initiated on EL215 with impact on E215 and EL415 (still open, see detail in box 14)
1CREL104: delay in the maintenance activity of EL415 due to coil procurement delay. The indian subcontractor was followed by DRI, US branch of STPI sold to TE Connectivity (open sice no alternative to DRI as been yet put in place, see box 14)

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The undersigned hereby certifies on behalf of the ESCC Executive - that the above information is correct; - that the appropriate documentation has been evaluated; - that full compliance to all ESCC requirements is evidence (except as stated in box 15;) - that the reports and data are available at the ESCC Executive and therefore applies on behalf of CNES as the responsible Executive Member for ESCC qualification status to be extended to the component(s) listed herein.

Date: 02/05/2022

JP BUSSENOT
(Signature of the Executive Coordinator)

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Continuation of Boxes above:

NCCS : (CNES / ESA / REL teleconference dated 28/04/2022)

2CREL103 : particles on 15A relays.contacts initiated through a field failure at AIRBUS DS on a non-QPL 12V EL215 relay Sn66 date code 1622 Investigations showed a presence of a large particle on the contact, but also that this seemed to be accidental compared to other lots observed.

AIRBUS DS performed systematic analysis of the contacts cleanliness during its second semester 2021 procurements, showing no problem as reported in email dated 31st of January 2022:
3 parts from 5 lots of EL215-300 28V relays from date codes 2117, 2124, 2136, 2143 and 2145 did not show any pollution

REL agreed to performed a similar analysis on 2021 15A relays maintenance lots. This has been done on E215, EL215 and EL415 relays lots (REL report 3727.02.21 refers), at least at initial production step on EL415.

The MRB also agreed with the implementation by REL of a statistical control of contacts resistance as a potential warning. As of April 2022, REL did not implement this action (action in progress – due date to be confirmed by REL). The review of the EL415 data package provided for this maintenance activity showed that among 51 relays tested during Chart F2, 8 were rejected as contact resistance failures (Dossier de Contrôle 168-21 refers). An analysis of the failed parts has been requested from REL on the 28th of April 2022 (due date to be confirmed by REL). As a reference, other "dossiers de contrôle" submitted with this application (Dc 227-20, 51-21 and 178-21) showed respectively 0 / 120, 0 / 142 and 1 / 29 contact resistance failures during Chart F2.

1CREL104 : raised in July 2021 to follow the reason of significant delay in providing maintenance data (validity of certificate 98 was April 2021). One of the reasons was the late delivery of coils by the subcontractor Globatronics (India).
This subcontracting activity has been qualified at a time when REL had a capability to follow directly their distant subcontractor.

More recently, this activity has been "sub-contracted" to STPI US entity DRI. Since the announcement of DRI acquisition by TE Connectivity In November 2020, REL has been requested to explain how they would maintain their control on Globatronics activity. (CNES email dated 6th of January 2021 refers).

REL informed us about their willingness to subcontract this activity to Bureau Veritas (implementation schedule to be confirmed by REL, first audit expected in June / July 2022).

Both NCCS will need to be up-dated by REL to reflect these actions and their progress

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Non compliance to ESCC requirements:

No.:	Specification	Paragraph	Non compliance

16

Additional tasks required to achieve full compliance for ESCC qualification or rationale for acceptability of noncompliance:

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Executive Manager Disposition

Application Approval: Yes ☒ No ☐

Action / Remarks:

Date:

B. Schade: Head of the Product Assurance and Safety Department

ANNEX 1: LIST OF TESTS DONE TO SUPPORT EXTENSION OF QUALIFICATION 18

Tests conducted in compliance with:

- ESCC 3602 generic specification; Chart F4 (for ESCC/QPL parts);
- Or PID-TFD [illegible] (for ESCC/QML parts)

Tests vehicle identification/description:

SCC 3602 004 06 28V (EL 415 142 A F70 DC 2129 / Lot 1913775)	SCC 3602 004 09B 28V (EL 415 143 A F70 YS DC 2046 / Lot 1778009)
SCC 3602 004 19 12V (EL 415 123 A M09 F70 DC 2126 / Lot 1944647)	SCC 3602 004 09B 28V (EL 415 143 A F70 YS DC 2115 / Lot 1852406)

Detail Specification reference: 3602/004

Chart F4	Test	Tick when done	Conditions	Date Code	Tested Qty	No. of Rejects	Comments if not performed. Comments on Rejection
Environmental / Mechanical Subgroup (Column 1)	Thermal Shock	☒	MIL-STD-202, Test Method 107	21-29	6	0	
	Low Level Sine Vibration	☒	MIL-STD-202, Test Method 204	21-29	6	0	
	Random Vibration	☐	MIL-STD-202, Test Method 214				NA
	Low Level Mechanical Shock	☒	MIL-STD-202, Test Method 213	21-29	6	0	
	Resistance to Soldering Heat	☒	MIL-STD-202, Test Method 210	21-29	6	0	
	Seal (Fine and Gross Leak)	☒	MIL-STD-202, Test Method 112	21-29	6	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	21-29	6	0	
Environmental / Mechanical Subgroup (Column 2)	High Level Sine Vibration	☒	MIL-STD-202, Test Method 204	21-29	6	0	
	High Level Mechanical Shock	☒	MIL-STD-202, Test Method 213	21-29	6	0	
	Seal (Fine and Gross Leak)	☒	MIL-STD-202, Test Method 112	21-29	6	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	21-29	6	0	
Endurance Subgroup 1 (Column 1)	Low Level Life	☐	ESCC 3602 Para. 8.11.1				NA
	Inductive Life	☒	ESCC 3602 Para. 8.11.2	21-29	3	0	
	Seal (Fine and Gross Leak)	☒	MIL-STD-202, Test Method 112	21-29	3	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	21-29	3	0	

Chart F4	Test	Tick when done	Conditions	Date Code	Tested Qty	No. of Rejects	Comments if not performed. Comments on Rejection
Endurance Subgroup 1 (Column 2)	Coil Life	☐	ESCC 3602 Para. 8.12				
	Seal (Fine and Gross Leak)	☐	MIL-STD-202, Test Method 112				
	External Visual Inspection	☐	ESCC Basic Specification No. 20500				
Endurance Subgroup 1 (Column 3)	Intermediate Current	☒	ESCC 3602 Para. 8.13	21-29	3	0	
	Mechanical Life	☒	ESCC 3602 Para. 8.14	21-29	3	0	
	Seal (Fine and Gross Leak)	☒	MIL-STD-202, Test Method 112	21-29	3	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	21-29	3	0	
Endurance Subgroup 2	Resistive Life	☒	ESCC 3602 Para. 8.11.3	21-26 21-29	6 6	0	
	Seal (Fine and Gross Leak)	☒	MIL-STD-202, Test Method 112	21-26 21-29	6 6	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	21-26 21-29	6 6	0	
Assembly Capability Subgroup	Solderability	☒	MIL-STD-202, Test Method 208	20-46 21-15 21-29	2 2 3	0	
	Overload	☒	ESCC 3602 Para. 8.16	20-46 21-15 21-29	2 2 3	0	
	Permanence of Marking	☐	ESCC Basic Specification No. 24800				NA
	Terminal Strength	☒	MIL-STD-202, Test Method 211	20-46 21-15 21-29	2 2 3	0	
	Seal (Fine and Gross Leak)	☒	MIL-STD-202, Test Method 112	20-46 21-15 21-29	2 2 3	0	
Additional Tests		☐					
		☐					
		☐					

NOTES ON THE COMPLETION OF THE APPLICATION FORM FOR ESCC QUALIFICATION EXTENSION APPROVAL

ENTRIES

Form heading	shall indicate: - the title of the component as given in its detail specification or the name of the series, family; - the Executive Member; - the entering date; - the certificate number and its sequential suffix.
Box 1	shall provide details given in the table; in particular there shall be listed: - the variants or range of variants; - the range of components (the ESCC code is recommended to indicate the values or values range, the tolerance, the voltage, etc); the designation given in the detail specification as 'base on'; - under Test Vehicle enter either an ESCC code or the specific characteristic capable of identifying the component tested (e.g., voltage of coil for a relay); - under component similar enter a cross if relevant.
Box 2; 3 and 4	As per QPL entry; otherwise, an explanation of the changes must be supplied.
Box 5	Will show the ESCC Generic and Detail specifications, including issue number and revision letter, current at the time the tests reported were performed. If the specifications are different from those current on the date of the application, see Box 6.
Box 6	Will show the deviations from the Generic and Detail Specifications listed in Box 5, in particular deviations from testing. In case of deviations this must be listed in Box 15. In case the referenced specification in Box 5 have currently a different issue and/or revision indicate also whether the test data deviates or not from such current documents.
Box 7	Must reference the report(s) supplied in support of the application.
Box 8	Should provide the details of procurement to the full ESCC System, documentation of all of which should already have been delivered to the ESCC Executive under the terms of the relevant Generic Specification. An appropriate table has been drawn in this box.
Box 9	If the PID evolved after the Original Qualification or after the last Extension of Qualification, adequate details of such evolution shall be provided together with the reasons for the changes. Major changes shall be clearly marked.
Box 10	Identify the current PID issue status, date and actual date of verification. The date of verification of the current PID should be arranged as close as possible to the required date of extension.
Box 11	This box can be completed only after a physical visit to the plant to confirm that no unexplained changes occurred and that the practices, procedures, material, etc. used in manufacturing the components are as described in the PID. This survey shall be carried out in accordance with the requirements of ESCC Basic Specification No. 20200 and its findings shall be recorded.
Box 12	Provide details of, or reference to, any Destructive Physical Analysis (DPA) and Failure Analysis reports as well as any Nonconformance(s) (NCCS) occurred during the qualification validity period, stating if established corrective action have produced satisfactory results.
Box 13	Enter only the name of the Executive Member (i.e., CNES, DLR, ESTEC, etc.) and the signature of the responsible Executive Coordinator.
Box 14	To be used when there is a need to expand any of the boxes from 1 through 12. Identify box affected and reference the Box 14 in the relevant Box. Box 14 can be broken into 14a, 14b, etc. if several boxes have to be expanded.
Box 15	Fill in Table as requested.
Box 16	Any additional action deemed necessary by the Executive Member to bring the submitted data to a standard likely to be accepted by the ESCC Executive should be listed herein or the reason(s) to accept the noncompliance.
Box 17	All Executive Manager recommendations on the application itself, special conditions or restrictions, modifications of the QPL or QML entry, letters to the manufacturer, etc. shall be entered clearly in Box 19, signed by the representative for ESA, and dated.
Box 18	Fill in Table as requested.
Box 19	Confidential Details of PID changes including those of a confidential nature, shall be provided.
Box 20	State noncompliance with reference to specification(s) and paragraph(s). To simplify reference in Box 16 each nonconformance shall be sequentially numbered. If relevant state 'None'.
Box 21	Any additional action deemed necessary by the Executive Member to bring the submitted data to a standard likely to be accepted by the ESCC Executive should be listed herein or the reason(s) to accept the noncompliance.
Box 22	Additional Comments.