



EDMS NO. 1756283	REV. 1.3	VALIDITY DRAFT
ACQUISITION		PUBLIC

LIST OF FORESEEN DEPARTMENTAL REQUESTS (DRs) FOR THE NEXT TWO YEARS

Item	Package Name	Work Package Reference	Detailed Description	Foreseen Cost Range	Foreseen Date for Purchasing Process	Domains Of Activity 1	Domains Of Activity 2 (if any)
1	Austenitic stainless steel strips for the HL-LHC superconducting magnets collars	WP03 WP11	Supply of 475 tonnes of austenitic stainless steel strips for the manufacture of collars of the HL-LHC superconducting magnets.	>750k	Feb-17	Raw Materials	N/A
2	Q2 Series - Heat exchanger tube	WP03	Heat exchanger tube for the 1st and the 2nd prototype. Orders might be split out for each prototype.	50k<<200k	May-18	Magnets components and assemblies	N/A
3	Q2 - Strand for series	WP03	Strand for the manufacturing of the Q2 series (2 magnets, PIT wire)	>750k	Mar-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
4	Q2 - Strand for series	WP03	Strand for the manufacturing of the Q2 series (2 magnets, RRP wire)	>750k	Mar-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
5	Q2 - Strand for series	WP03	Strand for the manufacturing of the Q2 series (6 magnets, RRP or PIT wire, not yet decided)	>750k	Dec-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
6	D2-Q4 Corrector series	WP03	A series of 16+4 corrector magnets for Q4 and D2 - Nb-Ti ribbon cable	>750k	Jan-18	Magnets components and assemblies	N/A
7	NL correctors	WP03	Series of 36 correctors, plus 9 spares, of 5 different type, based on Nb-Ti wire, superferic	>750k	Jan-18	Magnets components and assemblies	N/A
8	MCBXFA/B - Single Aperture Corrector Package	WP03	Series of 4+2 long correctors (2.2 m long) plus 8+2 short correctors (1.2 m long) based on Rutherford cable	>750k	Jan-18	Magnets components and assemblies	N/A
9	Q2 Series - Coil production	WP03	Fabrication of 2 coils and assembly in one CERN prototype, fabrication of 40 series coils and assembly of 8 series magnets includes procurement of tooling for assembly and coil manufacturing. Insulated cable, and all coil and structure components provided by CERN	>750k	Aug-16	Magnets components and assemblies	N/A
10	Circuits & cables for Quench protection heaters	WP03 WP11	Supply of quench heaters (QH) for HL-LHC magnets. The QH are large flexible printed circuits that are produced by a photolithographic process. The Cu coated QH base material is provided by CERN. Supply of quench heaters for HL-LHC magnets: 11 T dipole, MQXF short model, MQXF long prototype and series, MQXFA, MQXFB, MQY, MBRD, MCBXFA, MCBXFB, MQ, MQY	>750k	Mar-17	Magnets components and assemblies	N/A
11	Shells for MQXFB prototype	WP03	Manufacturing of 8 MQXFB prototype shells. Details : Manufacturing of 8 austenitic steel shells for the prototypes of MQXFB with an inner radius of 307 mm, a thickness of 8 mm, and a total length of 10000 mm. Specific conditions or qualification criteria : The firm shall be able to form stainless steel shells with a thickness in the range of 8 mm, and a total length of 10 meters. It shall also have expertise in machining (chamfering) and dimensional inspection.	50k<<200k	Apr-17	Magnets components and assemblies	N/A
12	Q2 - Supporting Structure	WP03	Supply of supporting structures for the inner triplet quadrupole magnets MQXFB including the yoke, load pad and collar structure. CERN intends to place a contract for the supporting structures of the new inner triplet quadrupole magnets MQXFB, including the thick yoke, load-pads and collars. The yoke laminations are 50 mm thick and with outer radius of 278 mm separated in four segments. These yoke thick laminations will be assembled together with yoke thin laminations 5.8 mm thick to form a full length stack of about 7.5 m. The pad laminations are 50 mm thick, 20 mm wide and ~200 mm tall. These pad thick laminations will be assembled together with pad thin laminations 5.8 mm thick to form a full length stack of about 7.5 m. The collars are 50 mm thick lamination with an inner radius of 114 mm and a width of about 20 mm. The geometries require high precision milling and/or EDM machining.	>750k	Feb-17	Magnets components and assemblies	N/A
13	Q2 Series - Parts raw material for supporting structure	WP03	Supply of ARMCO raw material needed for the fabrication of the main supporting components (yoke, loadpads, masters, end-plates) of the new inner triplet MQXFB magnets. CERN intends to place a contract for the raw material needed to machine the shells for the new inner triplet quadrupole magnets MQXFB.	200k<<750k	Feb-17	Raw Materials	N/A
14	Q2 Series - Raw material for the Al Shells	WP03	Supply of Aluminium raw material for the outer shells of the new inner triplet MQXFB magnets. CERN intends to place a contract for the raw material needed to machine the shells of the new inner triplet quadrupole magnets MQXFB.	200k<<750k	Feb-17	Magnets components and assemblies	N/A
15	Q2 Series - Machining shell, masters	WP03	Supply of main components (Aluminium shells, master-plates, end-plates) needed for the new inner triplet MQXFB magnets. CERN intends to place a contract for the raw material needed to machine the shells of the new inner triplet quadrupole magnets MQXFB. The aluminium shells, machined from rolled rings have an outer diameter of 614 mm and a length of up to 800 mm. 10 of these yoke shell with be used in each magnet. The master plates are have a length of ~3.7 m (magnet half-length) and a width of 230 mm with a thickness of 15 mm. The end plates are 75 and 50 mm thick, with a square cross-section with a side of about 300 mm.	>750k	Feb-17	Magnets components and assemblies	N/A
16	Cold Bore	WP12 WP03 WP11	Precision machined seamless AISI 316LN stainless steel cold bores from CERN supplied raw material: - 4 for short and long D2 proto's. - 4 for MQY proto's. - 71 for HL-LHC series cryo-magnets. - Inner diameter ranging from 80 to 139 mm. - Inner diameter tolerance ISO H8. - Wall thickness ranging from 2.6 to 4 mm. - Wall thickness tolerance +0/-0.25 mm. - Unit lengths up to 13.5 m.	>750k	Feb-17	High precision Assembling and manufacturing technologies	N/A
17	Collars for HL-LHC magnets	WP03 WP11	Fine-blanked austenitic steel laminations that are needed for the collared coils. The MS for the steel laminations of the 11T Dipoles will be also used for the WP3 magnets	>750k	May-17	Magnets components and assemblies	High precision Assembling and manufacturing technologies
18	MQXFB Magnet Coil Pack Tooling	WP03	Manufacture of a tooling for coil pack accrding drawing LHC/MQXF/T1117.	50k<<200k	Apr-17	Magnets components and assemblies	N/A
19	MQXFB Magnet Rods and Keys	WP03	Manufacture of rods and keys for 2 MQXFB parotype magnets	50k<<200k	Apr-17	Magnets components and assemblies	N/A
20	RF - LRF & Fast Controls	WP04	Faraday cage for Low Level RF racks	50k<<200k	Feb-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
21	DQW Crab Cavities Pre-series and Series - Supply of Niobium (Nb) and Niobium Titanium (Nb-Ti)	WP04	Raw material required for the Bare Cavities and HOMs manufacturing	>750k	Apr-17	Raw Materials	N/A
22	DQW Crab Cavities Pre-series and Series - Manufacturing of Bare Cavities, He Tanks and assembly of Dressed Cavities	WP04	Full manufacturing of Bare Cavities and Helium Tanks. Assembly of the Dressed Cavities (Bare Cavity+Cold Magnetic Shield produced by others+HOM Couplers & Pick-ups produced by others+He Tank)	>750k	Apr-17	High precision Assembling and manufacturing technologies	N/A
23	DQW Crab Cavities Pre-series and Series - Manufacturing of HOM Couplers & Pick-ups	WP04	Full manufacturing of all variants of High Order Modules (HOMs) and Pick-ups to be installed in the Dressed Cavities	>750k	Jun-17	High precision Assembling and manufacturing technologies	N/A
24	DQW Crab Cavities Pre-series and Series - Manufacturing of Cold Magnetic Shields	WP04	Full manufacturing of the Cold Magnetic Shields to be installed in the Dressed Cavities	200k<<750k	Jun-17	High precision Assembling and manufacturing technologies	N/A
25	Niobium and Nb-Ti for RFD Cavity	WP04	Material to be used for RFD cavities production. Depending on the quantity at stock, some order may be launched (not confirmed)	50k<<200k	Apr-17	Raw Materials	N/A
26	RFD Cryomodule Prototype - Vacuum Vessel	WP04	Vacuum vessel for the RFD cryomodule to be tested in SPS within the crab cavities framework	50k<<200k	Feb-18	Raw Materials	N/A
27	Halo Cleaning - Absorber blocks for TCSPM	WP05	Supply of a minimum of 120 absorber blocks for the HL-LHC collimator jaws. This will involve the production of a novel material based on Molybdenum Carbide - Graphite composite (MoGr), its post-production heat treatments and the machining to the specified geometrical and dimensional requirements.	>750k	Mar-16	Collimators and new material resistant to high temperatures	Raw Materials
28	IR Cleaning - Absorber blocks for TCTPM	WP05	Supply of an estimated quantity of 100 absorber Copper - Diamond composite blocks for HL-LHC collimators. This involves the production of a material based on Copper - Diamond composite, its heat treatments and the machining to the specified geometrical and dimensional requirements.	200k<<750k	Oct-16	Collimators and new material resistant to high temperatures	Raw Materials
29	Halo Cleaning - Crystal Collimation (TCCP)	WP05	Components crystal collimation ions at IR7	50k<<200k	Aug-17	Collimators and new material resistant to high temperatures	N/A
30	IR Cleaning - TCSPM (Target Collimator Tertiary Pick-up Metallic), TCTPM (Target Primary Collimator Pick-up Metallic), TCPPM (Target Primary Collimator Pick-up Metallic) DS Collimation - TCLDA (Target Collimator Long Dispersion Suppressor)	WP05	Manufacture and supply of 24 collimators to be installed during LS2	>750k	Nov-16	Collimators and new material resistant to high temperatures	N/A
31	Stainless Steel 304L and 316LN	WP05	Raw material for the manufacturing of the Vacuum tanks (LS2)	200k<<750k	Apr-17	Raw Materials	N/A
32	Connectors	WP05	Connectors with multiple and single connection	50k<<200k	Jun-17	Others	N/A
33	Roller Screws	WP05	Mechanical actuator that requires high precision and rigidity and will be used as a component of the collimators to be installed for LS2	200k<<750k	Jul-17	High precision Assembling and manufacturing technologies	N/A

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34	Cryogenic storage for Crab Cavities at SPS	WP04 WP09	Vertical liquid Nitrogen storage tank. Industrial Standard. 1 Unit of about 1000l	50k<<<200k	Oct-16	Cryogenics systems for HL-LHC	N/A
35	Prototype - Cabling of superconductors	WP06A	HTS Cables for the triplets	50k<<<200k	01/06/2017 (TBC)	Electrical Equipment, electronics and instrumentation for accelerators	N/A
36	Prototype - Cable assembly	WP06A	Grouping of sub cables in the final link	50k<<<200k	01/08/2017 (TBC)	Electrical Equipment, electronics and instrumentation for accelerators	N/A
37	Prototype - Cabling of superconductors	WP06A	HTS Cables for Matching Sections (MSs)	200k<<<750k	15/06/2017 (TBC)	Electrical Equipment, electronics and instrumentation for accelerators	N/A
38	Prototype - Current Leads for prototype	WP06A	Manufacturing of mechanical components for current leads according to CERN execution drawings. The current leads are needed for i) the SM-18 test stations (16 units rated at 2 kA); ii) a prototype HL-LHC Cold Powering System (4 units rated at 18 kA, 15 units rated at 2 kA and 23 units rated at 0.2 kA); iii) the LHC consolidation project (15 current lead assemblies, each containing four 600 A LHC HTS current leads).	>750k	Oct-16	Electrical Equipment, electronics and instrumentation for accelerators	N/A
39	Series - Cabling of superconductors	WP06A	1000 km superconductor wire for series production	>750k	01/07/2017 (TBC)	Electrical Equipment, electronics and instrumentation for accelerators	N/A
40	Series - Cabling of superconductors	WP06A	HTS Cables for series production for triplets	>750k	01/09/2017 (TBC)	Electrical Equipment, electronics and instrumentation for accelerators	N/A
41	Series - Cabling of superconductors	WP06A	MgB2 cable (for the triplets) required for series production	>750k	01/09/2017 (TBC)	Electrical Equipment, electronics and instrumentation for accelerators	N/A
42	Series - Cabling of superconductors	WP06A	HTS Cable configuration for Matching Sections (MSs) for the series production	>750k	01/09/2017 (TBC)	Electrical Equipment, electronics and instrumentation for accelerators	N/A
43	Series - Superconducting Link Cryostat	WP06A	100m-long semi flexible cryostats for the Superconducting Link of HL-LHC project. Series production	>750k	01/02/2018 (TBC)	Cryostats and subcomponents for cryogenic equipment	N/A
44	Series - DF Cryostat	WP06A	Cryostats for series production	>750k	01/09/2017 (TBC)	Cryostats and subcomponents for cryogenic equipment	N/A
45	Series - Cabling of superconductors	WP06A	MgB2 cables configuration for Matching Sections (MSs) for series production	>750k	01/07/2018 (TBC)	Electrical Equipment, electronics and instrumentation for accelerators	N/A
46	Series - DFH Cryostat	WP06A	Cryostats for series production (Matching sections and triplets)	>750k	01/09/2017 (TBC)	Cryostats and subcomponents for cryogenic equipment	N/A
47	Measurement&controls - DCCT (Direct Current Transformer)	WP06B	Device for high precision current measurement	50k<<200k	May-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
48	Experimental cryostat	WP07	LHe vertical bath cryostat to be used during superconducting magnet and magnet component damage tests with beam in CERN's HiRadMat facility	50k<<<200k	Jun-17	Cryostats and subcomponents for cryogenic equipment	N/A
49	CLIQ System	WP07	Coupling-Loss Induced Quench (CLIQ) system to be used as quench detection system for the HL-LHC project	200k<<<750k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
50	Mechanical DC Switches	WP07	Mechanical low DC (1.5 kA) switches that belong to the Energy Extraction System of the LHC	200k<<<750k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
51	Cold by-pass diodes	WP07	Cold by-pass diodes 13kA and 17kA for the Energy extraction system of the LHC	50k<<<200k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
52	Assembly of Cold Diodes	WP07	Assembly of Cold Diodes to be used within the Energy Extraction System of the LHC. E-Beam welding shall be required	50k<<<200k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	High precision Assembling and manufacturing technologies
53	Electronic & Communication Boards	WP07	Electronic Boards for the Quench Detection System of the LHC	200k<<<750k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
54	Technical infrastructures (Cabling)	WP07	Devices for Communication system and cabling	50k<<<200k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
55	TAXS - VAX relocation - Plug-in connectors	WP08	Plug-in connectors (multiple connection; power, control & pneumatic) for the VAX relocation prototyping works	50k<<<200k	Mar-17	Others	N/A
56	TAXS - VAX relocation - Support Structure	WP08	Aluminium Support structure, flanges and mobile modules for the prototype of the VAX that need to be relocated.	50k<<<200k	Mar-17	High precision Assembling and manufacturing technologies	N/A
57	TANB - Thermocouples and heaters	WP08	Alignment targets for the TANB	50k<<<200k	Apr-17	Others	N/A
58	TANB - Raw Material - Wolfram/Densimet/Inermet	WP08	High Density Tungsten alloy, Inermet type, for manufacturing the TANB (Neutral target absorbers for insertion region neutrals) to be built for LHCb	50k<<<200k	Apr-17	Raw Materials	N/A
59	TANB - Raw Material - Iron	WP08	Iron for manufacturing the TANB (Neutral target absorbers for insertion region neutrals) to be built for LHCb	50k<<<200k	Apr-17	Raw Materials	N/A
60	Machining in situ of components	WP08	Machining of metallic structures	50k<<<200k	Mar-18	High precision Assembling and manufacturing technologies	N/A
61	Cryogenic valves for helium	WP09	Supply of cryogenic control and On/Off valves for the cryogenic distribution system of the superconducting RF crab cavities test facilities currently under construction at SPS-BAG and SM18 bunker M7 at CERN.	50k<<<200k	Nov-16	Cryogenics systems for HL-LHC	N/A
62	Vacuum Vessels	WP11	Supply of 4 vacuum vessels for the WP11 bypass cryostats for installation of collimators in the LHC dispersion suppressor regions. Details : The vacuum vessels consist of three large tubes welded to common end flanges of 1055 mm in diameter, resulting in a total length of approximately 1.6 m. Precision machining of interfaces is required in order to ensure proper alignment of the internal components in the LHC particle accelerator. All vacuum vessels are made from austenitic stainless steel. This is a build to print supply according to drawings and specifications provided by CERN.	200k<<<750k	Sep-16	Cryostats and subcomponents for cryogenic equipment	High precision Assembling and manufacturing technologies
63	Vacuum Vessels	WP11	Supply of 13 vacuum vessels for the 11T dipole magnets and connection cryostats for installation of collimators in the LHC dispersion suppressor regions during the long	200k<<<750k	Sep-16	Cryostats and subcomponents for cryogenic equipment	High precision Assembling and manufacturing technologies
64	Copper Lyras	WP11	Oxygen-free copper lyras that are needed for the bus bars manufacturing	50k<<<200k	May-17	Magnets components and assemblies	N/A
65	ODS Wedges	WP03 WP11	Cold drawn precision profiles (wedges) made of aluminium oxide dispersion strengthened (ODS) copper	>750k	May-16	Magnets components and assemblies	N/A
66	Assembly works of collaring coils	WP11	Fabrication of 8 collared coils of the 11T dipole for HL-LHC. Details : - The fabrication of the coils and collared coils shall take place at CERN in the Large Magnet Facility in bldg. 180, using the CERN tooling; - The collared coils shall be conforming to the CERN CAD models and drawings; - The components will be provided by CERN; - The QC shall be part of the supply.	>750k	Oct-16	Others	N/A
67	SLS Coil End Spacers	WP11	SLS printed stainless steel end spacers for the DS11T coils.	50k<<<200k	May-17	Magnets components and assemblies	N/A
68	Heat Exchanger Tubes	WP11	Oxygen-free copper heat-exchanger tubes that are needed for the cold mass assembly of the 11T dipole	50k<<<200k	May-17	Magnets components and assemblies	N/A
69	Removable Poles	WP11	Loading Titanium poles which are needed for the collared coil assembly of the 11T dipole. Loading Pole made from TiAl6V4.	200k<<<750k	May-17	Magnets components and assemblies	N/A
70	Resin for coil impregnation	WP03 WP11	Resin required for impregnation of Nb3Sn magnets	50k<<<200k	Oct-17	Raw Materials	N/A
71	Flat End Covers	WP11	Austenitic stainless steel end covers that are needed for the cold mass assembly of the 11T dipole	50k<<<200k	May-17	Magnets components and assemblies	N/A
72	Tooling - Impregnation Mould	WP11	Supply of high precision mechanical parts for the assembly of one impregnation moulds for the production of the Nb3Sn coils of the 11 T dipole magnet for the HL-LHC Project. Deliveries are foreseen within 21 weeks after award of the contract.	50k<<<200k	Feb-17	High precision Assembling and manufacturing technologies	N/A
73	Tooling - Reaction Tool	WP11	High precision mechanical parts for the assembly of one reaction fixture for the heat treatment of the Nb3Sn coils of the 11 T dipole magnet Project. Deliveries are foreseen over 21 weeks from placement of the HL-LHC the contract.	50k<<<200k	Feb-17	High precision Assembling and manufacturing technologies	N/A
74	Shells for HL-LHC magnets	WP03 WP11	Supply of about 74 austenitic steel shells for the cold masses required for the High Luminosity Large Hadron Collider (HL-LHC): *18 austenitic steel shells for 11T. *26 austenitic steel shells for Q2A/B. *14 austenitic steel shells for CP. *16 austenitic steel shells for D2. The MS for the shells of the 11T dipoles will be also used WP3 magnets	>750k	Feb-17	Magnets components and assemblies	N/A
75	Collaring Shims	WP11	Sheet in various thicknesses 0.1-0.4mm thickness made from 1.4435 for the shimming of the DS11T.	50k<<<200k	May-17	Magnets components and assemblies	N/A
76	11T Spacers - Coating	WP11	The head spacers of the DS11T magnets coil need to be coated with Al2O3 to improve the electrical integrity of the coils.	50k<<<200k	Apr-17	Magnets components and assemblies	N/A
77	Cold mass structure for connection cryostats	WP11	Cold mass structure for connection cryostats	200k<<<750k	May-17	Cryostats and subcomponents for cryogenic equipment	N/A
78	End Covers for connection cryostats	WP11	End Covers for the connection cryostats of 11T	50k<<<200k	Jun-17	Cryostats and subcomponents for cryogenic equipment	N/A
79	Magnet/Collared Coils End plates	WP11	End plates collars	200k<<<750k	Jun-17	Magnets components and assemblies	High precision Assembling and manufacturing technologies
80	Steel Laminations (Yoke laminations)	WP03 WP11	Supply of about 312000 laminations made up of low-carbon steel and non-magnetic steel, for the magnets required for the HL-LHC. -2500 steel laminations for 11T -114200 steel laminations for MQXFB -5200 steel laminations MCBXF8 -5200 steel laminations MCBXFA -16900 steel laminations for MBRD -9000 steel laminations for MCBRD The firm shall have expertise in steel fine-blanking operations and/or price machining, and dimensional inspection.	>750k	Feb-17	Magnets components and assemblies	High precision Assembling and manufacturing technologies

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81	Vacuum vessel sleeves for the interconnects to the bypass cryostats	WP11	Vacuum vessel sleeves for the interconnects to the bypass cryostats in LHC IR2 and IR5 Sleeves equipped with flanges at the extremities. Diameter 1055 mm, length 930 mm. External pressure: 1 bar. Internal pressure: vacuum. Quantities: 8 units for installation plus 4 spares Specific conditions or qualification criteria: CE Certification for pressure applications. Vacuum leak tightness. Cleaning for cryogenic applications	50k<<<200k	Apr-17	Cryostats and subcomponents for cryogenic equipment	N/A
82	Universal expansion joints for WP11 bypass cryostat	WP11	Universal expansion joints for WP11 bypass cryostat Universal expansion joints in stainless steel consisting of an assembly of a pipe with weldable flanges at the extremities and two bellows. The expansion joints shall be delivered in kits corresponding to the number of units necessary to assemble one bypass cryostat. Each kit consists of 6 universal expansion joints of different designs. Pre-series: 2 kits (12 universal expansion joints) Series: 7 kits (42 universal expansion joints) Specific conditions or qualification criteria : The expansion joints shall be delivered with CE certification for pressure applications and operation at 1.9 K. The design, qualification tests and quality control tests shall be performed by the supplier according to CERN specifications. A pre-series shall be delivered for approval by CERN before series production	50k<<<200k	Apr-17	Cryostats and subcomponents for cryogenic equipment	N/A
83	Bottom Trays for the 11T dipole	WP11	Supply of 13 machined bottom trays for the 11T dipole magnets and connection cryostats for installation of collimators in the LHC dispersion suppressor regions during the long shutdown two (LS2). Details : The bottom trays are machined from existing CERN LHC stock aluminium extrusions up to 6 m in length. Precision machining of interfaces is required in order to ensure proper alignment. Up to four design variants are possible. Aluminium/st. steel transition elements will be welded to the extremities at CERN. This is a build to print supply according to drawings and specifications provided by CERN. Specific conditions or qualification criteria : The bidders must have proven experience in the fabrication of equipment of comparable dimensions and complexity and, as a minimum: - Have an implemented quality assurance system; - Have at their disposal a milling machine of appropriate size and precision to perform the machining; - Have at their disposal the appropriate quality control equipment and certified personnel.	50k<<<200k	Apr-17	Cryostats and subcomponents for cryogenic equipment	N/A
84	CC4C - Dished ends	WP11	Procurement of the dished ends forming the shuffling modules of the new connection cryostats, the cost includes: - Material - Forming - Welding - Machining	50k<<<200k	Apr-17	Cryostats and subcomponents for cryogenic equipment	N/A
85	CC4C cold masses	WP11	Procurement of the structural beam froming the cold mass of the new connection cryostats, the cost includes: - Material - Machining - Heat treatment	50k<<<200k	Apr-17	Cryostats and subcomponents for cryogenic equipment	N/A
86	Raw materials - Tungsten absorbers for series production	WP12	Supply of around 8000 kg of precision machined tungsten absorbers with unit lengths of 400 mm for HL-LHC beam screens in IR 1&5. Tungsten heavy alloy with >95% W, Cu and Ni (Ni <=3.5%, Fe <30 ppm). Magnetic permeability < 1.005 between 4.2 and 293 K.	>750k	Mar-17	Raw Materials	Ultra high vacuum components and systems
87	Beam Screen Facility plus Finishing	WP12	Beam Screen Facility plus Finishing (laser engineered welding machine). Industrial laser machine to be installed in the beam screen facility in SMA18. The laser will be used for the assembly of HL-LHC beam screens from components purchased in industry. Production of up to 100 HL-LHC beam screen tubes for the new cryo-magnets in IR 1&5. Details : - Material will be free-issued by CERN (stainless steel strip, co-laminated with an OFe-Cu layer, with a cross section of 1.08 mm x 195 mm). - Manufacturing will include cutting to width, punching of pumping slots, local removal of copper from the welding zone, forming of half-shells and laser welding of the half shells to closed tubes with an octagonal cross section. - Beam screen tube diameter will range from 70 to 130 mm, unit lengths will range from 4 to 13 m. Total cumulative beam screen tube length will be around 1000 m.	200k<<<750k	Jan-17	Others	N/A
88	Beam Screen Tubes	WP12	Production of up to 100 HL-LHC beam screen tubes for the new cryo-magnets in IR 1&5. Details : - Material will be free-issued by CERN (stainless steel strip, co-laminated with an OFe-Cu layer, with a cross section of 1.08 mm x 195 mm). - Manufacturing will include cutting to width, punching of pumping slots, local removal of copper from the welding zone, forming of half-shells and laser welding of the half shells to closed tubes with an octagonal cross section. - Beam screen tube diameter will range from 70 to 130 mm, unit lengths will range from 4 to 13 m. Total cumulative beam screen tube length will be around 1000 m.	>750k	Dec-17	Ultra high vacuum components and systems	High precision Assembling and manufacturing technologies
89	PIM (Plug-in modules)	WP12	Shielded Bellows expansion joints	200k<<<750k	Dec-18	Ultra high vacuum components and systems	High precision Assembling and manufacturing technologies
90	Assembly Bench and insertion tooling	WP12	Assembly Bench and insertion tooling	50k<<<200k	Jan-18	Others	N/A
91	Interconnect (Beam vacuum + cooling)	WP12	Flexible 'interconnects' to ensure continuity of vacuum, along with local electrical and (where necessary) cryogenic services	50k<<<200k	Dec-18	Ultra high vacuum components and systems	High precision Assembling and manufacturing technologies
92	Titane and Supporting System	WP12	Titane and supporting system for the UHV in the LHC	50k<<<200k	Dec-17	Ultra high vacuum components and systems	High precision Assembling and manufacturing technologies
93	Ion-pump (VPI) controllers	WP12	VPI re-cabling Point 3/Point 7 and new controllers	200k<<<750k	Jan-18	Ultra high vacuum components and systems	N/A
94	Cold-warm Transitions	WP12	The CWTs will connect the cryogenic-cooled beam pipes to the room temperature region.	200k<<<750k	Dec-18	Ultra high vacuum components and systems	N/A
95	Tooling: Beam Screen Horizontal Coating	WP12	Tooling: Beam Screen Horizontal Coating	200k<<<750k	Mar-18	Others	N/A
96	Thermal Link	WP12	Thermal links made of copper to be installed between the tungsten absorbers and the cooling tubes.	50k<<<200k	Dec-17	Ultra high vacuum components and systems	High precision Assembling and manufacturing technologies
97	Beak-out System	WP12	Bake-out system for the LHC: Jackets, cables, thermocouples...	50k<<<200k	Dec-17	Ultra high vacuum components and systems	N/A
98	Beam diagnostics & instrumentation - BLM (Beam loss monitors)	WP13	Component BLM - CVD diamond detectors for the measurement of particle beams	200k<<<750k	Jul-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
99	Beam diagnostics & instrumentation - BLM (Beam loss monitors)	WP13	Semi-Rigid, Radio Frequency, Coaxial Cables utilizing glass-metal or brazed ceramic sealing technology for use in cryogenic and radiation environments.	200k<<<750k	Jul-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
100	Beam diagnostics & instrumentation - BLM (Beam loss monitors)	WP13	Electronics	200k<<<750k	Jul-22	Electrical Equipment, electronics and instrumentation for accelerators	N/A
101	Beam diagnostics & instrumentation - BPM (Beam position monitors)	WP13	Mechanical components for BPM	200k<<<750k	Oct-18	Ultra high vacuum components and systems	N/A
102	Beam diagnostics & instrumentation - BPM (Beam position monitors)	WP13	Radio Frequency UHV feedthroughs utilising glass-metal or brazed ceramic sealing technology for use in cryogenic and radioactive environments.	200k<<<750k	Oct-18	Ultra high vacuum components and systems	N/A
103	Beam diagnostics & instrumentation - BPM (Beam position monitors)	WP13	Radio Frequency UHV feedthroughs utilising glass-metal or brazed ceramic sealing technology for use in cryogenic and radioactive environments.	200k<<<750k	Jul-20	Electrical Equipment, electronics and instrumentation for accelerators	N/A
104	Beam diagnostics & instrumentation - BPM (Beam position monitors)	WP13	Electronics	200k<<<750k	Jul-22	Electrical Equipment, electronics and instrumentation for accelerators	N/A
105	Beam diagnostics & instrumentation - BSR (Synchrotron Light Monitors)	WP13	Streak Cameras	200k<<<750k	Jan-23	Electrical Equipment, electronics and instrumentation for accelerators	N/A
106	Beam diagnostics & instrumentation - BGV (Beam Gas Vertex Detector)	WP13	Vacuum System	200k<<<750k	Jul-21	Ultra high vacuum components and systems	N/A
107	TDIS prototype - Raw Material - Graphite	WP14	Highly purified Graphite that will be used to manufacture Beam Absorbing Blocks.	50k<<<200k	Oct-17	Collimators and new material resistant to high temperatures	Raw Materials
108	TDIS prototype - Roller Screw	WP14	Mechanical actuator that requires high precision and rigidity and will be used as a component of the injection system (TDIS)	50k<<<200k	Sep-17	Collimators and new material resistant to high temperatures	High precision Assembling and manufacturing technologies
109	TDIS prototype - Vacuum Vessel production (Machining & Welding) of raw materials	WP14	Vacuum vessels to be manufactured for the TDIS prototype (Stainless Steel 304 with flanges in Stainless Steel 316LN). Raw material will be provided by CERN	200k<<<750k	Apr-17	High precision Assembling and manufacturing technologies	Collimators and new material resistant to high temperatures
110	TDIS prototype - Aluminium back Stiffener	WP14	Fabrication of Aluminium back stiffeners for the TDIS jaws. Component of the jaws	50k<<<200k	Jun-17	High precision Assembling and manufacturing technologies	N/A
111	TDIS prototype - Aluminium Platinas	WP14	Aluminium platinas for the TDIS. Precision machining is required	50k<<<200k	Jul-17	High precision Assembling and manufacturing technologies	N/A
112	TDIS prototype - Jacks	WP14	Standard Jacks for the alignment of the TDIS	50k<<<200k	Aug-17	High precision Assembling and manufacturing technologies	N/A
113	Coating of high purity alumina tube (phase 2)	WP14	Coating of single (prototype) high purity alumina tube	50k<<<200k	Mar-18	High precision Assembling and manufacturing technologies	Ultra high vacuum components and systems
114	15 Ceramic Tubes for MKI	WP14	Ceramic Tubes	50k<<<200k	Feb-17	High precision Assembling and manufacturing technologies	Raw Materials
115	Coating of vacuum tanks or cooling system	WP14	Coating of vacuum tanks or cooling system	50k<<<200k	Feb-18	High precision Assembling and manufacturing technologies	N/A
116	Oven controls, diesel generator	WP14	Oven controls, diesel generator	50k<<<200k	Feb-18	High precision Assembling and manufacturing technologies	N/A
117	Warm storage for Crab Cavities at SP5	WP09 WP04	Vertical gaseous Helium storage tanks for pressure up to 15 bar. Industrial Standard	50k<<<200k	May-17	Cryogenics systems for HL-LHC	N/A



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LIST OF FORESEEN DEPARTMENTAL REQUESTS (DRs) FOR THE NEXT TWO YEARS

Item	Package Name	Work Package Reference	Detailed Description	Foreseen Cost Range	Foreseen Date for Purchasing Process	Domains Of Activity 1	Domains Of Activity 2 (if any)
118	Survey - Alignment & Internal Metrology	WP15	Acquisition of 4 laser tracker systems and software (SA). -Measurement range from 1m to 100m -Angular accuracy of better than 8ppm -Levelling accuracy of better than 1.5 arc sec -Dynamic measurement frequency of 1kHz -Possibility to trigger measurements with external signal -Compatible with Spatial Analyzer	200k<<750k	Sep-16	Others	N/A
119	WP 17 - Civil Engineering - Construction Underground and Surface for P1	WP17	CERN intends to place one or more contracts for the delivery of civil engineering works related to High Luminosity-LHC project. The works will be located in Meyrin (Switzerland)and Cessy (France). Two contracts will be established, one for Underground works 2018 to 2022 and another one for Surface works as of 2024	c>750k	May-17	Civil Engineering and Technical Infrastructures	N/A
120	Civil Engineering - Construction Underground and Surface for P5	WP17	CERN intends to place one or more contracts for the delivery of civil engineering works related to High Luminosity-LHC project. The works will be located in Meyrin (Switzerland) and Cessy (France). Two contracts will be established, one for Underground works 2018 to 2022 and another one for Surface works as of 2024	c>750k	May-17	Civil Engineering and Technical Infrastructures	N/A