

## **Approved EIC Equipment List**

Electrical, Instrumentation, Controls & Communications

Document Number AM 2848

## Document Control

Rev	Date	Revision Details	Clause	Author	Approved
0	13/08/20	<p>The EIC committee had reviewed various sections of this Standard on 5 occasions. We have set revision to rev 0.</p> <p>We have decided to segregate the original AM2714 into separate standards, namely:</p> <ul style="list-style-type: none"><li>• <u>AM2714 – Electrical Standards</u></li><li>• <u>AM2832 – Instrumentation &amp; Controls Standards</u></li><li>• <u>AM2847 – Communications Standards</u></li><li>• <u>AM2851 – Inspection, Commissioning &amp; Handover Standards</u></li><li>• <b><u>AM2848 – Approved EIC Equipment List (this document)</u></b></li></ul>	All	EIC Committee	A. Gabriel C. Paxman
0.1	22/01/21	Added LTE Directional Antennas. Also added an Access Control section with Card Reader model and Cable Spec.	Telemetry & Access Control	L Bassett	
0.2	9/3/2021	Outdoor Light	Switchboard/General	J. Street	
0.3	17/05/21	Cisco IE-5000 switches to the standard switch unit list	Ethernet Switch	S Cordy	A. Gabriel C. Paxman
0.4	8/6/2021	Added / Updated Air Flow sensors, Radar level sensor, Pressure Transmitters, Thermowell , MCD600	Tables	J. Street	J. Myyrlainen
	22/7/2021	Added Solar PV Panels & Inverters	Solar	A. Gabriel	EICC Committee
0.5	7/10/2021	Added ELV & Signal Surge Arrestors	Power Distribution	L Bassett	
	25/10/21	Added EMIOT Emergency & Exit Lights	Power Distribution	J. Street	
		Added High Density Network Switch	Automation	L Bassett	

AM2848- Approved EIC Equipment List

0.6	22/12/21	Added Security & CCTV Section Added Indoor and Outdoor PIR Detectors, CCTV Cameras & Network Switches	Access Control Security & CCTV	L Bassett	
0.7	30/3/22	Updated outside light	General	J.Street	
0.8	28/4/22	Updated with Chemical tank level device	Instrumentation chemical level sensor, switches, flow meters	J.Street	
0.9	15/8/22	Updated as per supplier changes and clarifications. Harmonic filters, DC UPS, Exit/Emerg Gateway	Various	J.Street	

## Approved EIC Equipment List

To maintain standard across site equipment, an approved list of equipment is provided in this document. A status condition is given against each item indicating the prerequisite level.

“**Fixed**” means that this is a **mandatory** requirement of South East Water.

“**Preferred**” means that the requirement is a preferred requirement of South East Water, however, South East Water would be willing to consider varying the requirement if there is substantiation that the proposed variance will produce an equal or superior outcome. A *Preferred* status is a *Fixed* status until such time as approval from South East Water is given to vary the requirement.

“**Flexible**” means that South East Water does not have mandatory or preferred requirements for the particular aspect of the project.

“**N**” column indicates the product is relevant to Network facilities.

“**TP**” column indicates the product is relevant to Treatment Plants.

Description	Requirement	N	T P	TP Spar e	Status
<b>AUTOMATION</b>					
Ethernet Switch	Low density switching; Cisco IE3000-4TC (4 ports available + additional 2 uplink ports; fibre or copper)		Y	Y	Fixed
	Medium density switching; Cisco IE3000-8TC (8 ports available + additional 2 uplink ports; fibre or copper)		Y	Y	Fixed
	Medium density switching; Cisco IE4000-4GC4GP4G-E (Maximum flexibility, 8 ports available & 4 x PoE, Gigabit all ports + Additional 4 uplink ports; fibre or copper)		Y	Y	Fixed
	High density switching; Cisco IE-4000-8GT8GP4G-E (Maximum flexibility, 16 ports available & 8 x PoE, Gigabit all ports + Additional 4 uplink ports; fibre or copper)		Y	Y	Fixed
	High density switching in 19 inch racks; Cisco IE-4010-4S24P		Y		Fixed
Operator interface panel	C-more EA3-T6CL	Y			Fixed
	Red Lion Graphite (Indoor use): G12C1100		Y	Y	Fixed
	Red Lion Graphite (Outdoor use): G12S1100		Y	Y	Preferred
	Red Lion Graphite (Outdoor use): G10S1000		Y	Y	Preferred
Programmable Logic Controller (PLC)	GE/Emerson		Y		Fixed
	RX3i 12 slot universal base - Part No IC695CHS012		Y	Y	Fixed
	RX3i 7 slot universal base - Part No IC695CHS007 (for small installations, vendor packages and remote IO monitoring only)		Y	Y	Fixed
	RX3i 24VDC power supply, 40 watts - Part No IC695PSD040		Y		Fixed
	CPE330 2 slot CPU, 1.1Ghz, 64 Mbyte – Part No IC695CPK330		Y	Y	Fixed
	Ethernet Module – Part No IC695ETM001		Y	Y	Fixed

AM2848- Approved EIC Equipment List

Description	Requirement	N	T P	TP Spare	Status
	Profinet Controller Module (field IO) – Part No IC695PNC001		Y	Y	Fixed
	Profinet Scanner Module (Remote IO and Rack Expansion) - Part No IC695PNS001		Y	Y	Fixed
	RX3i 32-Point 24 VDC Input module: Part No IC694MDL655		Y	Y	Fixed
	RX3i 16-Point, 24 VDC (not AC), 2 Amp, Relay Output module: Part No IC694MDL940		Y	Y	Fixed
	RX3i 16-Point, 24 VDC, 4-20mA, Analog Input module: Part No IC694ALG223		Y	Y	Fixed
	RX3i 8-Point, 24 VDC, 4-20mA, Analog Output module: Part No IC694ALG392		Y	Y	Fixed
	RX3i 6-Point (4 Inputs, 2 Outputs), 24 VDC, 4-20mA, Analog Combination Current/Voltage Input/Output module: Part No IC694ALG442		Y	Y	Fixed
	RX3i Blanks for unused slots: Part No IC694ACC310		Y	Y	Fixed
	Siemens 6ES72141BG400XB0 CPU 1214C, AC/DC/Relay, 14DI/10DQ/2AI (Sewer High Level Backup System) If a non-standard program is installed must be supplied with a 6ES79548LC030AA0 4MB Flash Card	Y			Fixed
Protocol converters and data loggers	Redlion DA30D protocol converter and data acquisition system with data logger, web server and virtual HMI: Part No DA30D0F000000000		Y	Y	Fixed
<b>INSTRUMENTATION (WATER)</b>					
Flow Switch	IFM Efector SI5000 or SA5000 ( Not to be used as a flowmeter)	Y	Y		Flexible
Fittings & Valves	Swagelok	Y	Y		Fixed
Flowmeter (Magnetic)	Siemens SITRANS FM MAG 5100W flow tube.MAG 6000, IP67 (NEMA 4x/6) Polyamid signal convertor, 24 VDC complete with add-on bus module for HART communication	Y	Y		Fixed
	Rosemount 8750W with Remote 24V DC transmitter, Hart and Verification unlocked.	Y	Y		Preferred
	E&H Promag W IP68 Buried Sensor or W O x DN with Remote 24V DC transmitter, Hart and Verification unlocked.	Y	Y		Preferred
Flow Meter (Insertion)	ABB WaterMaster	Y	Y		Preferred
Level Sensor (Hydrostatic)	Vegawell 52 c/w Hart & VegaDIS82 Adjustment Unit	Y	Y	Y	Preferred
	BD sensor 446100112H121027	Y	Y	Y	Preferred
Level Sensor (Laser)	ABB LLT100 including Dust tube	Y	Y	Y	Preferred
Level switch	MJK	Y	Y		Preferred
Chemical Tank Non-contact level Switch	IFM Capacitive	Y	Y		Preferred
Chemical Tank Level Sensor (Radar)	Vega Puls 31, VEGADIS82 with hart for a remote display if the tank is above 1200mm , 3" threaded flanges plastic LDPP – GFLK.AHGX-AU, Platform required for maintaining instrument	Y	Y		Preferred
Pressure Switch	United Electric Controls	Y	Y		Preferred
Pressure Gauge	Wika - Stainless Steel, Metres Water Gauge, 160mm dia.	Y	Y		Preferred

**AM2848- Approved EIC Equipment List**

Description	Requirement	N	T P	TP Spar e	Status
	Floyd - Stainless Steel, Metres Water Gauge, 150mm dia.	Y	Y		Preferred
Pressure Transmitter ( & Differential )	Rosemount 3051 – Digital display, Hart comms	Y	Y		Fixed
Signal Convertor	Red Lion IAMA3535	Y	Y		Preferred
Temperature Sensor	Siemens SITRANS TF	Y	Y		Preferred
	Rosemount 248	Y	Y		Preferred
	Prominent	Y	Y		Preferred
	WTW	Y	Y		Preferred
	E&H	Y	Y		Preferred
	Hatch	Y	Y		Preferred
	pH	Siemens (Evoqua)	Y	Y	
Prominent		Y	Y		Preferred
WTW		Y	Y		Preferred
Rosemount		Y	Y		Preferred
E&H		Y	Y		Preferred
Hatch		Y	Y		Preferred
Turbidity		Hatch	Y	Y	
	Hatch	Y	Y		Preferred
EC	Prominent	Y	Y		Flexible
	E&H	Y	Y		Flexible
ORP	E&H	Y	Y		Flexible
UVT	Real Tech	Y	Y		Preferred
Free / Total Chlorine	Siemens (Evoqua)	Y	Y		Preferred
<b><i>INSTRUMENTATION (SEWAGE / SLUDGE / SOLIDS)</i></b>					
Flowmeter (Magnetic)	Siemens SITRANS F M MAG 5100 W 7ME6520-3TN12-2AA1 Complete with IP67 / NEMA 4X/6, Polyamid enclosure & display, 11-30V DC/11-24V 7ME6910-1AA30-1AA0	Y	Y	Y	Preferred
	Rosemount 8750W with Remote 24V DC transmitter, Hart and Verification unlocked.	Y	Y	Y	Preferred
	E&H Promag W IP68 Buried Sensor or W O x DN with Remote 24V DC transmitter, Hart and Verification unlocked.	Y	Y	Y	Preferred
Level Sensor (Hydrostatic)	Vegawell 52 c/w Hart & VegaDIS82 Adjustment Unit	Y	Y		Preferred
	BD sensor 446100112H121027	Y	Y		Preferred
Chemical Tank Level Sensor (Radar)	Vega Puls 31, VEGADIS82 with hart for a remote display if the tank is above 1200mm , 3" threaded flanges plastic LDPP – GFLK.AHGX-AU, Platform required for maintaining instrument	Y	Y	Y	Preferred
Level Sensor (Laser)	ABB LLT100 including Dust tube	Y	Y		Preferred
Level switch	MJK	Y	Y		Preferred
Chemical Tank Non-contact level Switch	IFM	Y	Y		Preferred
Temperature Sensor	WTW	Y	Y		Flexible
	Rosemount	Y	Y		Flexible
Total Suspended Solids	WTW	Y	Y		Flexible

**AM2848- Approved EIC Equipment List**

Description	Requirement	N	T P	TP Spar e	Status
pH	MJK	Y	Y		Flexible
	WTW	Y	Y		Flexible
EC	Honeywell (Technology must be non-contact toroidal)	Y	Y		Flexible
	Yokogawa (Technology must be non-contact toroidal)	Y	Y		Flexible
NH3	ChemScan	Y	Y		Preferred
NO3	ChemScan	Y	Y		Preferred
Turbidity	Hatch 1720E	Y	Y		Preferred
DO	WTW	Y	Y		Flexible
ORP	WTW	Y	Y		Flexible
Air Flow	Rosemount 3051SFA Annubar Flow Meter	Y	Y	Y	Preferred
	E&H Pro line t-mass B	Y	Y	Y	Preferred
<b>MOTOR CONTROL / CONTROL GENERAL</b>					
Ammeters	Crompton Parkinson	Y	Y		Flexible
	NHP	Y	Y		Flexible
Hour run meter	NHP	Y	Y		Flexible
Contactors	Sprecher and Schuh	Y	Y		Preferred
Contactor Overload	Sprecher and Schuh Electronic CEP7	Y	Y		Preferred
Electronic motor protection relay	Sprecher and Schuh	Y	Y		Preferred
Indicator Lamps	NHP LED BA9s, Separate Termination Block and Globe	Y	Y		Preferred
Junction box	Clipsal Schneider Electric Crouse-Hinds series GUP	Y	Y		Preferred
Motor junction box (wet well)	NHP Fibox IP68 (Clear Lid) with Wing screws	Y	Y		Fixed
Potentiometer	Kraus & Naimer CA10 NZV049FT202 FH	Y	Y		Flexible
Push buttons	NHP	Y	Y		Preferred
Relays	NHP Finder	Y	Y		Preferred
Relay Bases	NHP Finder 4 pole 94.04	Y			Preferred
Selector switches	Kraus & Naimer	Y	Y		Preferred
Soft Starter	Danfoss MCD600	Y	Y		Fixed
Solenoid Valves	Goyen	Y	Y		Preferred
	Danfoss EV Series	Y	Y		Preferred
Terminals	Weidmuller W Series - Screw Connection Terminal	Y	Y		Preferred
	Telemechanique Linergy TR - Screw Connection Terminal	Y	Y		Preferred
Thermistor relay	Sprecher and Schuh RT7 24-240V AC-DC	Y	Y		Preferred
Time delay relay	Syrelec	Y	Y		Preferred
Variable speed drive	Danfoss VLT Aqua Drive	Y	Y		Fixed
<b>POWER DISTRIBUTION</b>					
ACB	Terasaki fitted with internal removable handles and rack-out mechanism	Y	Y		Preferred
Circuit breakers	Terasaki	Y	Y		Preferred
	Schneider Electric - Merlin Gerin	Y	Y		Preferred

### AM2848- Approved EIC Equipment List

Description	Requirement	N	T P	TP Spar e	Status
Main switch	Merlin Gerin,	Y	Y		Preferred
	Kraus and Naimer	Y	Y		Preferred
	Terasaki	Y	Y		Preferred
Generator set Controller	DSE 7320 MKII	Y	Y		Fixed
Harmonic Filter - Active	For Units Greater than 100A units – (IP54 Minimum) Danfoss	Y	Y		Fixed
	For Units less than 100A Danfoss Sinexcel Schaffner Ecosine	Y	Y		Preferred
Power Meter	Schneider Electric – PowerLogic, PM8240 (panel mounted)	Y			Flexible
	Siemens SENTRON PAC3200- (1) with Profinet optional module (preferred), or (2) with Modbus TCP (no Profinet) up to 100m away, or (3) with Modbus RTU & RS485 optional module (no Profinet) b/w 100 and 1200m away			Y	Flexible
Miniature circuit breaker (MCB)	Schneider	Y	Y		Preferred
	Terasaki	Y	Y		Preferred
Moulded-case circuit breaker	Terasaki MCB DTLDC	Y	Y		Preferred
	Schneider	Y	Y		Preferred
Phase failure relay	NHP Adjustable Carlo Gavazzi	Y	Y		Preferred
Phase Sequence Indicator (Panel Mount)	Crompton 243-12P IME RQ72SE	Y	Y		Preferred
Source Transfer Switch	Merlin Gerin UA Controller, IVE Interlock	Y	Y		Fixed
Surge Arrester (Electricity Supply)	Cirprotec PSM Series Pluggable	Y	Y		Preferred
Surge Arrester (Equipment)	Novaris SFD Series	Y	Y		Preferred
Surge Arrester (ELV Supply up to 6A)	Novaris SSP6A-14-G (12VDC) Novaris SSP6A-38-G (36VDC/24VAC) Novaris SSP6A-65-G (48VDC/48VAC)	Y	Y		Preferred
Surge Arrester (Digital Signal)	Novaris SL18-G (12VDC) Novaris SL36-G (24VDC)	Y	Y		Preferred
Surge Arrestor (Instrument Loop)	Novaris SL420-G	Y	Y		Preferred
Surge Arrestor (UHF Radio)	Polyphaser IS- B50LN-C1 Novaris CN-FF-90-M1	Y	Y		Preferred
Surge Arrestor (Network Cat 6)	Novaris RJ45-POE Weidmuller VDATA CAT6 006D10V1	Y	Y		Preferred
Uninterruptable Power Supply	Socomec ITYS Pro 20kVA UPS – Circuit boards to be conformal coated from factory.	Y	Y		Fixed



AM2848- Approved EIC Equipment List

Description	Requirement	N	T P	TP Spar e	Status
(Treatment plants Only)					
UPS Surge Filter	Eaton ESFi 63A 3 Phase Input Surge Filter Wall Mounted	Y	Y		Preferred
Voltmeter	Crompton 244-01Q-SW7	Y	Y		Flexible
<b>240V AC UNINTERRUPTABLE POWER SUPPLY</b>					
UPS	Socomec ITYS Pro 20kVA		Y		Preferred
<b>DC POWER SUPPLY</b>					
Batteries	Yuasa (12 V Lead Acid)	Y	Y		Flexible
	Panasonic (12 V Lead Acid)	Y	Y		Flexible
DC Battery Charger	Puls UB40.241	Y			Preferred
DC to AC Inverter	Victron Energy – Phoenix Inverter	Y	Y		Fixed
DC Power Supplies	Meanwell SDR range (10 to 40 A)	Y			Preferred
Integrated 24V DC Power Supply	Dyne Industries LADDP100-30 (30A supply, required with minimum 150Ahr battery capacity)		Y		Fixed
Power DC Convertor	Puls CD5.121 24V-12V	Y	Y		Preferred
Power Supplies 48V DC	Weidmuller PROmax 240W 48V 5A	Y	Y		Preferred
<b>TELEMETRY</b>					
Antenna	RFI CSM700 Low Profile Omni Directional LTE Antenna	Y	Y		Fixed
	RFI COL7195 Collinear LTE Cellular Base Antenna	Y	Y		Fixed
	RFI LTE-XPOL-002-5G Directional LTE Antenna (Only to be used where reception from multiple towers not achievable)	Y	Y		Fixed
	RFI LTE-XPOL-2X2-5G Directional LTE Antenna (Only to be used where reception from multiple towers not achievable)	Y	Y		Fixed
Cellular Modems	Digi WR44R (SEW issued)	Y	Y		Fixed
	Digi WR31 (SEW issued)	Y	Y		Fixed
Remote Telemetry Unit (RTU)	Kingfisher II	Y	Y		Fixed
	Brodersen RTU 32M (Site Dependant)	Y	Y		Fixed
<b>DATA NETWORKS</b>					
19 inch server racks	APC NetShelter SX AR3350 is a 42U 750mm Wide x 1200mm Deep, Painted Black  42RU 600mm Wide x 800mm Deep Server Rack, Part#: 002.001.4280, Painted Black	Y	Y		Flexible
19 Inch Rack PDU	APC 2G, AP8859, Metered, ZeroU, 20A/208V, 16A/230V, (18) C13 & (2) C19	Y	Y		Fixed
19 Inch Rack Power Isolators	Clipsal 56 Series	Y	Y		Preferred
19 Inch Rack accessories	Cable management, shelves etc	Y	Y		Flexible
19 Inch Copper RJ45 Patch Panels	Belden 24 port Cat 6.	Y	Y		Preferred
19 Inch Fibre Patch Panels	Belden 2 x 12 port LC connector	Y	Y		Preferred

## AM2848- Approved EIC Equipment List

Description	Requirement	N	T P	TP Spar e	Status
Din Fibre and Copper Patch Panels	Belden MIP Range OM4 OS1/2 LC fibre and RJ45 Cat 6	Y	Y		Preferred
DIN Single Copper Patch Connector	Weidmuller IE-TO-RJ45-FJ-A DIN Rail mounted RJ45 with IDC		Y		Preferred
Cat6 Weatherproof Coupling	Amphenol LTW RDP-00BFFA-SLM7001 (Used in Poles)	Y	Y		Preferred
SFPs	Ruggedized 1000Mb Cisco if 100Mb Named brand	Y	Y		Preferred
Modbus Gateways	Moxa MGate MB3280	Y	Y		Preferred
Fibre Optic Cable	12 core rodent proof armoured OM4 or OS1/2	Y	Y		Preferred
Fibre Optic Patch Leads	LC connector standard inside cabinets Armoured if run outside cabinets	Y	Y		Preferred
<b>SWITCHBOARD / GENERAL</b>					
Light, public external	Light Planet Thor 2 LPTAF300W. Light mounting bracket must be ordered separately to suit mounting arrangement. LPTAFS – Spigot Bracket LPTAFWB – Wall Bracket LPTAFTB – Trunnion Bracket	Y	Y		Preferred
Light, Switchboard	Arlec Slimline Cabinet Light UC0074	Y	Y		Preferred
Emergency / Exit Lights	WBSTech - Network EMIOT Emergency & Exit Lights – Connected to cloud services linked to SEW. Gateway to have external antenna.	Y	Y		Preferred
Limit Switch (Switchboard Door)	Element14 - Reed Switch 1447651 – Normally Open Element14 - Magnet 1447652	Y	Y		Preferred
Terminal Strips	Weidmüller Type SAKR	Y	Y		Preferred
<b>ROTATING MACHINES / ACTUATORS</b>					
Actuators (Electric)	Rotork IQ4 or Limitorque, with manufacturer provided display covers and with 4-20ma position feedback	Y	Y		Preferred
Actuators (Pneumatic)	HOLD (further confirmation with vendor)				
Ventilation Fan	Lineo V0 Range In-line mixed flow fans	Y			Preferred
Fans					
Motors	<i>IES min, IE4 if practical, ABB, Toshiba, Siemens, Weg</i>				Flexible
<b>ACCESS CONTROL</b>					
Card Reader	HID-900PMNNEKE, HID multiCLASS SE RP10 Mini Mullion Reader, Mobile Ready, BLE, SIO & SEOS, Wiegand	Y	Y		Fixed
Reader Cabling	X2-CABLE-820 Access Control Composite Cable for Wiegand Readers	Y	Y		Fixed
<b>SECURITY &amp; CCTV</b>					
PTZ Camera w/IR	AXIS Q6135-LE PTZ w/Optimized IR Aluminium	Y	Y		Fixed
Dome Camera w/IR	AXIS Q3515-LVE External Dome Camera w/IR Aluminium	Y	Y		Fixed
Bullet Camera w/IR	AXIS Q1785-LE w/IR Aluminium	Y	Y		Fixed
Bullet Camera w/IR	AXIS P1455-LE 9mm w/IR Polycarbonate	Y	Y		Fixed
Indoor PIR	Bosch Blue Line PIR	Y	Y		Fixed
Outdoor PIR	Takex PIR-T15AM Precision Triple Mirror 80o (High Mount)	Y	Y		Fixed

AM2848- Approved EIC Equipment List

Description	Requirement	N	T P	TP Spar e	Status
	Takex MS-12FE Dual Zone 180o (Low Mount)				
PoE+ Network Switch (Non Rountable Networks)	AXIS T8508 PoE+ Network Switch AXIS T8516 PoE+ Network Switch	Y	Y		Fixed
<b>SOLAR</b>					
PV Panels	<ul style="list-style-type: none"> <li>• Trina</li> <li>• Jinko</li> <li>• Q Cells (Hanwha)</li> <li>• REC</li> <li>• Sunpower</li> <li>• LG Energy</li> </ul>		Y		Flexible
String-type Inverters	<ul style="list-style-type: none"> <li>• ABB</li> <li>• Schneider</li> <li>• SMA</li> <li>• Fronius</li> </ul>		Y		Flexible
Micro-inverters	<ul style="list-style-type: none"> <li>• Enphase</li> </ul>		Y		Flexible
Mounting systems for training arrays	<ul style="list-style-type: none"> <li>• Clean energy</li> </ul>		Y		Flexible
Protocols	<ul style="list-style-type: none"> <li>• Sunspec Alliance</li> </ul>		Y		Flexible