JEA Water Wastewater & Reuse Programing Standard

General:

Sample logic shall be submitted to JEA System admin SCADA group for preliminary review. At time of review JEA shall reserve the right to not use any block or logic not deemed satisfactory.

Integrator shall schedule a meeting with the System Admin Scada group before project work begins our group will provide sample projects and global libraries.

At wastewater plants SCADA shall be considered and programed to be the primary means of plant control, this is to include vendor panels. All OIT/ HMI functions shall be integrated into the Plant SCADA system.

Additions to plant projects shall be made using the plant current version of TIA portal. These shall be integrated into the plant project by the integrator, to keep one master TIA project for all plant PLC's and HMI's.

Vendors panel programing: it shall be up to the integrator to work with the vendor to get the appropriate data to ensure full SCADA control, and integrate vendor PLCs into the Plant project, on the plant Engineering Station.

Each network shall contain comments describing the function of the network.

Function Blocks in TIA shall not be nested more than 1 time. It shall be the common practice to use a function block for one piece of equipment that is used repeatedly in all JEA facilities. Not a system or part of a process. Examples of function blocks include VFD drive block, Pump Alternator, Analog Scaling, NOT an entire SBR, RAS control WAS control.

Lift stations, booster, and master pump station shall follow lift station programing standards.

Scalance switch configuration shall be part of the TIA Plant Project. If a Scalence switch is installed and is not part of a ring configuration, the ring function shall be disabled.

Tag Naming conversions shall follow SCADA HMI tag standards.

Local HMI screens shall follow SCADA graphics standards as much as possible.

Local HMI alarming shall be kept to a minimum, SCADA shall be considered the primary alarm source.

Local HMI screens passwords shall be discussed with System Admin SCADA team.

PLC and Plant networking shall follow the PERDUE model as provided in this standard (IPs will be provided by the System Admin SCADA team.

General TIA project layout

Devices & Networks

1. Project name shall be based on Physical address with the date of the last revision.

Example Greenland_WRF_Date, Arlington_East_WRF_date, 118st_MPS_date

Create a new project	>
Project name:	Greenland_WRF
Path:	C:\Users\mastar-admin\Desktop\V17
Version:	V17 💌
Author:	mastar-admin
Comment:	<u> </u>
	✓
	Create Cancel

2. Device Names for PLCs shall be PLC_(building #, area #) for multiple PLC's add "_#"

Example "PLC_WELL_1", "PLC_600","PLC_600_1"

PLC Passwords and Protections shall be discussed with SCADA system admin group before implementation.

					Modulo
Add new device		_			<u> </u>
Device name:					
PLC_8					
		^	Device:		^
	• 🔐 CPU 1511C-1 PN				
Controllers	 CPU 1512C-1 PN CPU 1513-1 PN 			°8 🛛	
	CPU 1515-2 PN			CPU 1516-3 PN/DP	
	6ES7 516-3AN00-0AB0		Anti-1	CEC 7 E1C 24N/02 04P0	
	6ES7 516-3AN01-0AB0	=	Article no.:	6E57 516-5AN02-0AB0	
HMI	CPU 1517-3 PN/DP		Version:	V2.9	-
			Description:		

3. Card Naming convention is as follows. DI 16ch Inputs 0-1 AI 8ch Inputs 2-17 DQ 8ch Output 0 CM Profibus CM Modbus Inputs 18-25 CP Profinet TIM Radio



4.Enable System and Clock memory. Leave default addresses

PLC_8 [CPU 1516-3 PN/DP]]		
General IO tags	System constants	Texts	
General PROFINET interface [X1]	System and clo	ck memory	
PROFINET interface [X2]	System memo	orv bits	
DP interface [X3]			
Startup			🛃 Enable the use of system memory byte
Cycle	Address of syst	em memory by	te
Communication load		(MB:	x): 1
System and clock memory		First cycl	e: %M1.0 (FirstScan)
SIMATIC Memory Card	Diagnostic	status change	d: %M1.1 (DiagStatusUpdate)
System diagnostics		Always 1 (high	%M1.2 (AlwaysTRUE)
PLC alarms		All of	
Webserver		Always 0 (low	V): [%M1.3 (AlwaysFALSE)
Display	a b		
Time of day	Clock memory	bits	
Restaction & Security	-		Cashle the use of clock memory bute
 OPC IIA 			Enable the use of clock memory byte
System power supply	Address of clo	ock memoryby (MB:	te x)· 0
 Advanced configuration 	-	10 Ha alaa	w White Clask 10Hz)
Connection resources		10 H2 Cloc	K: [76W0.0 (CIOCK_TOH2)
Overview of addresses		5 Hz cloc	:k: _%M0.1 (Clock_5Hz)
Runtime licenses		2.5 Hz cloc	:k: %M0.2 (Clock_2.5Hz)
		2 Hz cloc	k: %M0.3 (Clock_2Hz)
		1.25 Hz cloc	k: %M0.4 (Clock_1.25Hz)
		1 Hz cloc	k: %M0.5 (Clock_1Hz)
		0.625 Hz cloc	k: %M0.6 (Clock_0.625Hz)
		0.5 Hz cloc	k: %M0.7 (Clock_0.5Hz)

5.Network Devices

Shall be named by device P&ID name example RAS_PMP_508, RAS_VLV_508 Device number shall match IP last octet.

STANDARDS_LS_WRF_W	ATER > Devices & networks				
			🚽 Topology view	A Network view	Device view
Network Connection	s HMI connection 💌 🕎 🦉	1 🖽 🔲 🔍 ±		I	Network overvie 4
			# 10 system: PLC_8.PROFINET I	0-System (100) 🛆	Device
				=	 S7-1500/ET200
PLC 8	and hand from the				PLC_8
CPU 1516-3 PN/					CM PROFIBU CM PROFIBU
					CM MODBU
					 SINAMICS G 1
					RAS_PMP_5
	PLC_8.PROFINETIO-Sy	ste		-	
				-	
	RAS_PMP_508				
	G120 CU240E-2				
				~	
<			> 100% 💌	🕄 🔳	< 11
RAS_PMP_508 [G120 CU	240E-2 PN]		Q Properties	🗓 Info 🔒 🗓 Dia	ignostics 🛛 🗆 🖛
General IO tags	System constants Texts				
General	Subnet:	PN/IE_1			▼
 PROFINET interface [X 		Add new subnet			
General					
Telegram configura	Internet protocol version 4 (IPv4)			
Advanced options	IP address:				
Hardware identifier	Cubrat made				
Module parameter	Subnet mask.				
Hardware identifier		Synchronize router settings with to controller			
	Router address:				
	PROFINET				
		Generate PROFINET device name automatically			
	PROFINET device name:	ras_pmp_508			
	Converted name:	rasxbpmpxb508ab58			
	Device number:	5			-

6. HMI: Name same as PLC it is connected to.

	STANDARDS_LS_WRF_WATER	Devices & networks		_ # = ×
ret Heaverk i Connection Mid connect				Topology view 👗 Network view 👔 Device view
Picca Picca CH Highlighted: connection Picca CH 13163 PML Picca Picca Picca CH 13163 PML Picca Picca Picca </th <th>Network</th> <th>A connection 💌 🕎 🐂</th> <th>1 🖽 🔲 @, ±</th> <th>Network overvic 4</th>	Network	A connection 💌 🕎 🐂	1 🖽 🔲 @, ±	Network overvic 4
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CTU 13163 PML CTU 13163 PML TAL SPAPE JOB F1200 Confort FML (2 Consection 1) F1200 Confort FML (2 Consection 1) F1200 Confort F1200 C	PLC_8		HMI_8	PLC_8
HML_Connection_1 HML_	CPU 1516-3 PN/		KP1200 Comfort	CM PROFIBUS CMMODBU
Service (1) Name: Ind.8 Comments Name: Ind.8 Comments Comm				CP PROFINET
Image: Control Image: Control Image: Control Image: Con				 SINAMICS G_1
Art. Prop. 502 Art. Pro		HMI_Conn	ection_1	 RAS_PMP_5
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	G120	CU240E-2 000		
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ecreal	General IO tags Sy	stem constants Texts		
KOPIETInsefsce [x1] Komerian Kopierian Ko	General	Consul		<u>^</u>
Which intense [x2] information Proverlapplication type: [P2200 Combint Change device/ension Change device/ension Change device/ension Change device/ension Comment Comment Comment Catalog Information Catalog Informatio	PROFINET Interface [X1]	General		
Catalog Information Comment Catalog Information Catalog Informatio	 MPI/DP Interface [X2] Information 	Name	Las o	
Catalog Information		Device/application type:	KP1200 Comfort	
Catalog Information			Channe device/version	
Comment Commen		Author	mastaradmin	
Catalog Information Catalog Information Short designation: [FP1200 Comfort Description: [12.1" TF1 display, 1280 x 800 pirels, 16M colors; Key operation, 34 function keys, 28 system keys, 1 x MPI/PR0FBUS DP, 1 x A		Comment:		
Catalog Information		comment.		
Catalog Information Short designation: [xP1200 Comfort Description: [12.1" TFI display, 1280 x800 pixels, 164 xcolor; Key operation, 34 function keys, 28 system keys; 1 x MN/RP0FBUS DP, 1 x A				
Catalog Information Short designation: (FP1200 Comfort Description: (12.1"TFT display, 1280 x 800 pixels, 16M colors; Key operation, 34 function keys, 28 system keys; 1 x MPIROFBUS DP, 1 x A				
Short designation KP1200 Comfort Description 12.1 "IF1 display, 1380 x 800 pixels, 16W colors; Key operation, 34 function keys, 28 system keys; 1 x MM/R0FBUS DP, 1 x A				
Short designation: KP1200 Comfort Description: 211°TT (display, 1200 x800 pixels: 164/ colors: Key operation, 34 function keys, 28 system keys; 11 x MPROPRUS DP, 1 x A		Catalog information		
Description: 12.11" TFT display, 1280 x 2000 pixels, 16M colors; Key operation, 34 function keys, 28 system keys; 1 x MPIROFIBUS DP, 1 x		Catalog information		
		Catalog information	KP1200 Comfort	

Program Blocks

-OB1 (use from library it contains blocks that shall stay, all logic shall go on networks below) -Use OB1 as the main OB to call FC's. Include all error OB's from JEA Global Library.

-Cyclic OB's shall be used for PID's, GET, and PUT's

-Fault OB's shall be in a fault OB folder.

-All blocks shall be named with the block number first.

-Instance DB's shall have _inst following the block number in the name.





All I/O shall have tag names assigned.

🕶 🔚 PLC tags	[~	-	Vame	Data type	Addres	s F	letain	Acces	Writa	Visibl	Supervision	C
🖏 Show all tags		1		Spare_I0.0	Bool	%10.0							
📑 Add new tag table		2		Spare_I0.1	Bool	%I0.1	-						
嘴 Default tag table [91]		3		<add new=""></add>					 Image: A start of the start of		 Image: A start of the start of		
land the second													
lanalog Outputs [0]													
ligital Inputs [2]													
ligital Outputs [0]													
E PLC data types													
Watch and force tables													
🕨 🙀 Online backups													
🕨 🔄 Traces													
DPC UA communication													
Web applications													
Device proxy data													
Program info													
🖙 PLC supervisions & alarms													
PLC alarm text lists													
Local modules						_					_		
Distributed I/O		9			TER → PLC_8 [CPU 1								
Image:		=											
RAS_PMP_508 [G120 CU240E-2 PN]													
Ungrouped devices		3	1. A A A A A A A A A A A A A A A A A A A	🕈 🖭 🎬 🖤									
🕨 🚟 Security settings			Analo	g Inputs									
Cross-device functions			1	lame	Data type	Addres	ss F	letain	Acces	Writa	Visibl	Supervision	C
🕨 🙀 Common data		1		Spare_IW2	Int	%IW2							
Documentation settings		2	-	Spare_IW4	Int	🔳 %IW4	-						
Languages & resources		3		<add new=""></add>					V	V	V		
P													

UDTs shall be named with good description of device they will be used for, example VFD control word.

Purdue Model Networking

Devices on the controls network will be on the following subnet.

xxx Will be provided by JEA xxx

xxx Will be provided by JEA xxx

The 3rd octet will be specific to the plant location and be provided by JEA.

The SCADA server will have a second NIC and JEA will provide that IP.

Level 0

Devices on this level will be isolated by area and only be visible to the PLC they are associated with.

Level 1

PLCs will have 2 communications cards. One for the area devices and a second for PLC to PLC comms

Level 2

SCADA Servers/HMIs Servers will have 2 NICS- one tied to the controls/PLC network. The second Tie back to the domain controllers (these will be existing)

Level 3/3.5

These are domain controllers/patch servers and will include our DMZ. Vendors will stop at level 2

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