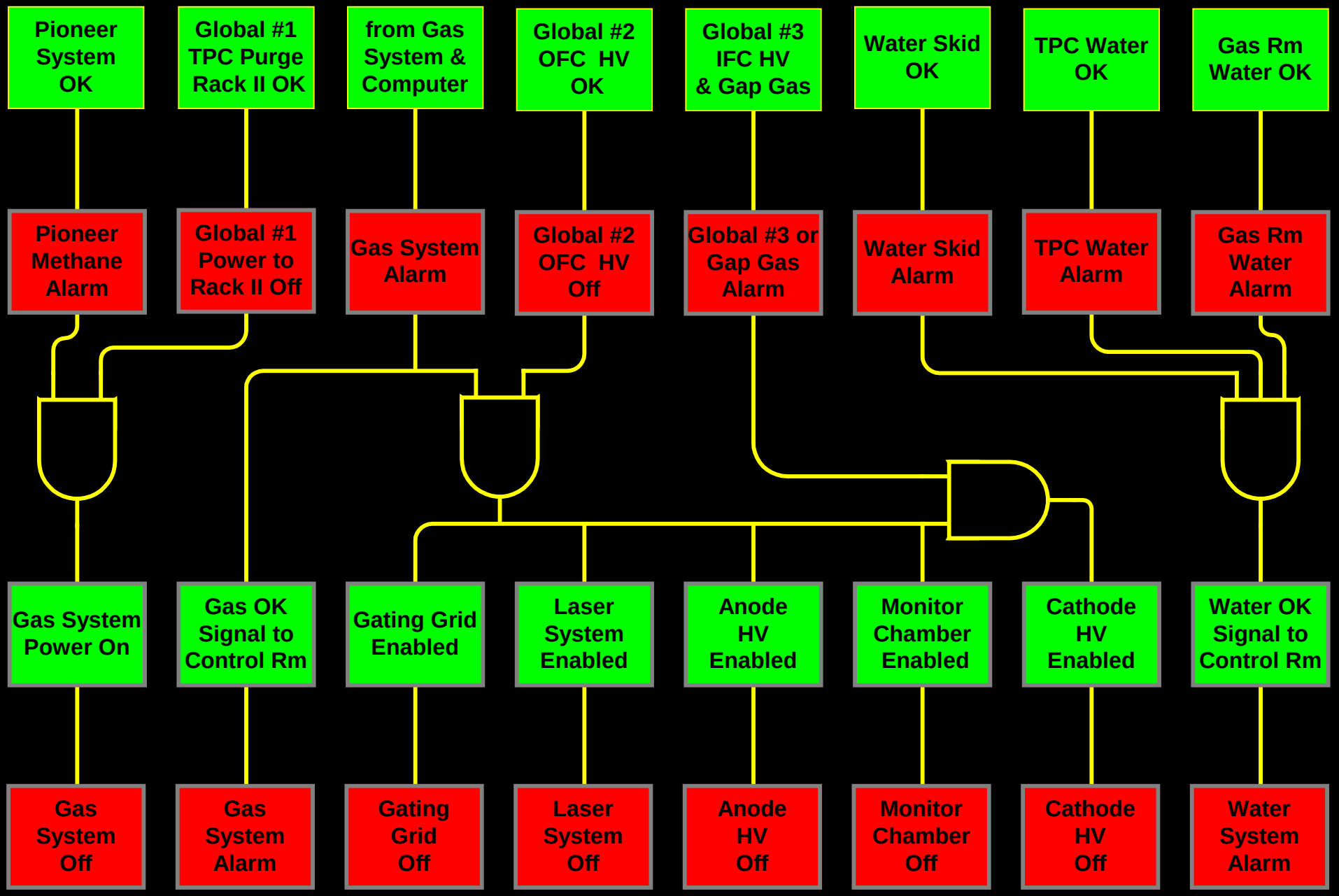
Allen Bradley Interlocks Front Panel - Attachment 1



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Sub-System	Global Interlocks #1 TPC Purge	High Level Methane	High Level Smoke (Delayed)	Global Interlocks #2 OFC OK to Run	High Level Methane	High Level Smoke (Prompt)	Detector Water Leaks	Global Interlocks #3 IFC OK to Run	High Level Methane	High Level Smoke (Prompt)	Detector Water Leaks	IFC Air Flow	Global Interlocks #4 Detector Water Leaks	Pioneer Gas Alarm - Methane in Gas Rm	Gas System Fault & Computer Status	Gas Room Water Leak	Gas Room Water Flow	TPC E&W Face Water Flow	OFC Water Flow	Methane in TPC Insulator Gap	Oxygen in TPC Insulator Gap	Water Skid Flow	Water Skid pH	Water Skid Oxygen Level	Water Skid Temperature	ODH Status	UPS Status	MCW Temperature
STAR Control Room - Water Alarm							X				X		X			X	X	X	X			X						
STAR Control Room - Gas Alarm		X	X		X	X			X	X				X	X													
TPC Water Valves Close							X				X		X					X	X			X						
Gas Rm Water Valves Close																X	X											
Power to TPC Gas System		X	X		X	X			X	X				X														
TPC Gating Grid		X	X		X	X	X		X	X	X		X	X	X													
TPC Anode		X	X		X	X	X		X	X	X		X	X	X													
TPC Cathode		X	X		X	X	X		X	X	X	X	X	X	X					X	X							
TPC Monitor Chamber		X	X		X	X	X		X	X	X		X	X	X													
Laser		X	X		X	X	X		X	X	X		X	X	X													
RICH		X	X		X	X	X		X	X	X		X	X														
FEE, MWC, TOFp & pVPD Electronics		X	X		X	X	X		X	X	X		X					X	X			X						
SVT & FTPC Electronics		X	X		X	X	X		X	X	X	X	X					X	X			X						
EMC & SMD Electronics		X	X		X	X	X		X	X	X		X															
SVT & FTPC Water							X				X		X															
Slow Controls		X	X		X	X	X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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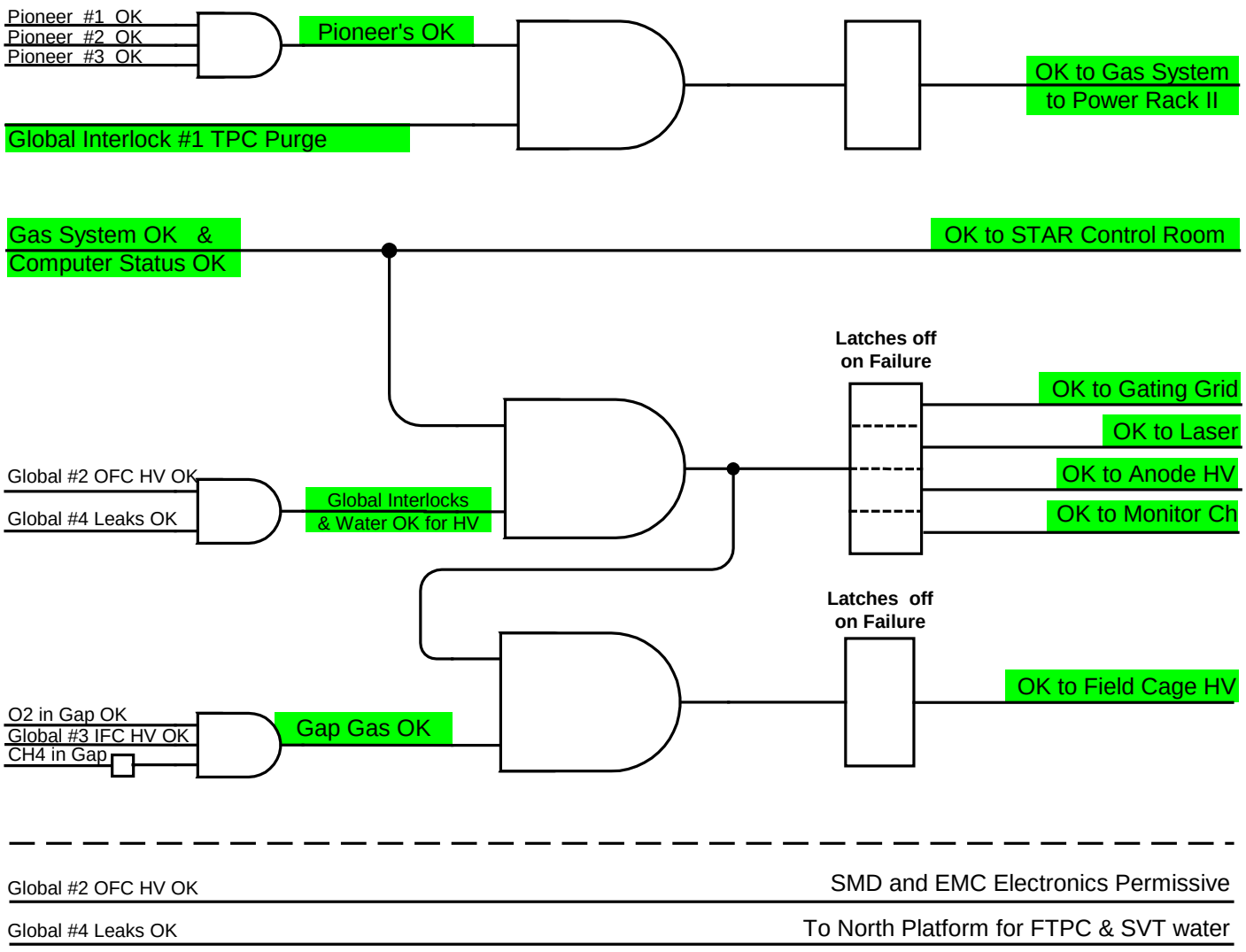
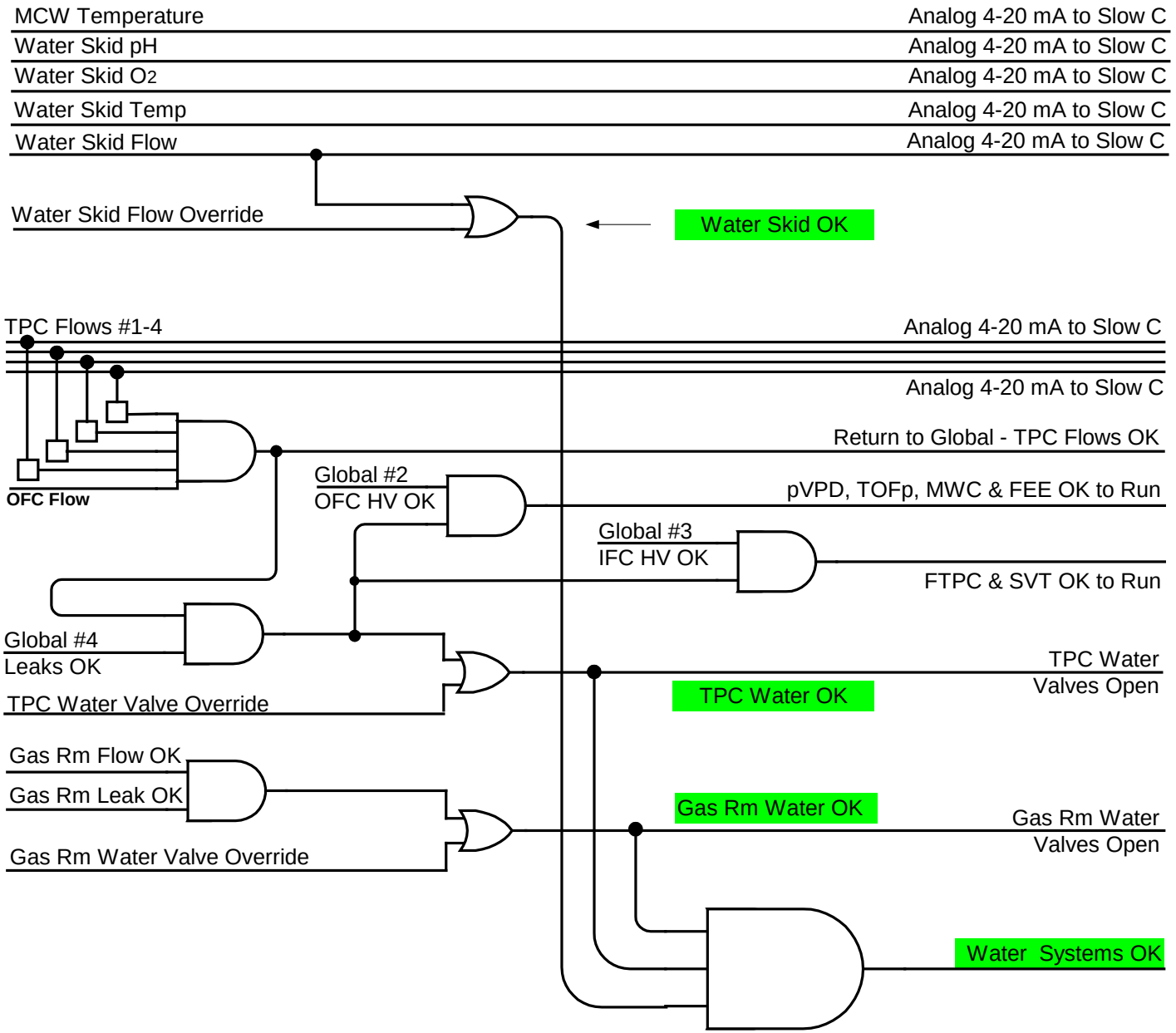
Attachment 2: Allen Bradley Logic Diagram



Attachment 2: Allen Bradley Logic Diagram (continued)



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Attachment 3: Allen Bradley Crate & Module Map

Master Crate in Gas Room

P2 Power Supply	CPU 5/03 16K Mem OS 302	1747-SN RIO Scanner to remote crate	1746-NI4 Analog Input 4 Ch. 4-20 mA or 0-10 V DC **Gap CH_4** **pH** **Flow** **O_2**	1746-IB16 24 V Input 16 Ch. **4- Pi** **Gas Flow** **Gas Leak** **Gas OK** **Gap O_2**	1746-NI4 Analog Input 4 Ch. 4-20 mA or 0-10 V DC **TPC Temp** **MCW Temp**	1746-OW16 24 V Output 16 Ch. Two groups of 8 **Eight Kybd Out** **OFC OK** **TPC Valves** **Gas Rm Valves**	1746-OX8 Relay Output 8 Ch. Indep ch's contact closure	1746-IB16 24 V Input 16 Ch. **Kbrd Ovrd 8 inp** **Water Skid Ovrd** **TPC Flow Ovrd** **Gas Flow Ovrd**	1746-IB32 24 V Input 32 Ch. Kbrd button input	1746-OB32 24 V Output 32 Ch. Kbrd lights output
Full Slot Addressing	0	1	2	3	4	5	6	7	8	9

ODH (8)
Gas Lo Lv Alarm (9)

UPS (11)
Three Gas Rm Inputs (13)
FTPC(14)
MCW(15)

IFC OK (11)

Three Platform Outputs (13-15)

Platform Alarm & Reset (11)

Gas Alarm (1)
Pioneer Alarm (2)
Global #2 (3)
Global #1 (4)
Global #4 (5)
Gas OR Water (6)
Water Alarm (7)

Attachment 3: Allen Bradley Crate & Module Map (continued)

Slave Crate on Platform

		0	32	64	96	128	160
P2 Power Supply	1747-ASB RIO Adapter from master crate	1746-NI4 Analog Input 4 Ch. 4-20 mA or 0-10 V DC **4 - TPC Flow**	1746-OW16 Relay Output 16 Ch. Two groups of 8 **Eight Kybd Out** **OFC OK** **TPC Valves** **Gas Rm Valves**	1746-IB16 24 V Input 16 Ch. **Glob #1** **Glob #2** **OFC Flow** **Glob #3** **Glob #4**	1746-OX8 Relay Output 8 Ch. Indep ch's contact closure **MWC (0)** **Flows OK (5)** **Kybd Out (1-4,6,7)**	1746-IG16 TTL Input 16 Ch. from Slow Control	1746-OG16 TTL Output 16 Ch. to Slow Control
1/2 Slot Addressing		0, 1	2, 3	4, 5	6, 7	8, 9	10, 11
			IFC OK (11) Flows OK (12) Three Gas Rm Outputs (13) FTPC(14) MCW(15)	4 TPC Flow Status (8-11) Three Platform Inputs (13-15)			

TTL 1 = B3:0
TTL 2 = B3:1
TTL 3 = B3:2
TTL 4 = B3:3
TTL 5 = B3:4
TTL 6 = Kpad 1&2
TTL 7 = Kpad 3&4
TTL 8 = Local Analog 1
TTL 9 = Local Analog 2
TTL 10 = Local Analog 3
TTL 11 = Local Analog 4
TTL 12 = Rmt Analog 1
TTL 13 = Rmt Analog 2
TTL 14 = Rmt Analog 3
TTL 15 = Rmt Analog 4
TTL 16 = Local Input
TTL 17 = Rmt Input
TTL 18 = Local Analog 5
TTL 19 = Local Analog 6
TTL 20 = Local Analog 7
TTL 21 = Local Analog 8

B3:0 = Logical inputs (0-11) [First level logic] (8 == OFC OK to run, 9 == TPC Flows OK, 10 == TPC Leaks OK, 11 == IFC OK to run)
B3:1 = Temp outputs (0-11) [Second level logic] (same map as B3:4)
B3:2 = Forced On Reg (0-10) (8 == Water Skid, 9 == TPC Water Valves, 10 == Gas Rm Water Valves)
B3:3 = Forced Off Reg (0-7)
B3:4 = Enable Output (0-11) (8 == OFC OK to run, 9 == TPC Water Valves, 10 == Gas Rm Water Valves, 11 == IFC OK to run)