# Simulink Design Verifier Report basictwotanks YUZEHONG

### Simulink Design Verifier Report: basictwotanks **YUZEHONG**

Publication date 27-Aug-2021 10:58:51

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### **Chapter 1. Summary**

#### **Analysis Information.**

Model:	basictwotanks
Mode:	Test generation

Model Representation: Built on 27-Aug-2021 10:53:12

Test generation target: Model

Status: Exceeded time limit

PreProcessing Time: 21s Analysis Time: 300s

#### **Objectives Status.**

Number of Objectives:	142
Objectives Unsatisfiable:	6
Objectives Undecided:	28
Objectives Satisfied - No Test Case:	99
Objectives Unsatisfiable under Approximation:	9

### **Chapter 2. Analysis Information**

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#### **Model Information**

File: basictwotanks

Version: 1.170

Time Stamp: Fri Nov 02 22:37:36 2018

Author: Kerianne

#### **Analysis Options**

Mode: TestGeneration
Rebuild Model Representation: IfChangeIsDetected

Test generation target: Model
Test Suite Optimization: Auto

Maximum Testcase Steps: 10000time steps
Test Conditions: UseLocalSettings
Test Objectives: UseLocalSettings
Model Coverage Objectives: ConditionDecision

Include Relational Boundary Objectiv- off

es:

Maximum Analysis Time: 300s
Block Replacement: off
Parameters Analysis: off
Include expected output values: off
Randomize data that do not affect the

outcome:

Additional analysis to reduce instanc- on

es of rational approximation:

Save Data: on Save Harness: off Save Report: off

### **Approximations**

Simulink Design Verifier performed the following approximations during analysis. These can impact the precision of the results generated by Simulink Design Verifier. Please see the product documentation for further details.

#	Туре	Description
1	Rational approximation	The model includes floating-point arithmetic. Simulink Design Verifier approximates floating-point arithmetic with rational number arithmetic. Specifying minimum and maximum values that mimic environmental constraints on root-level Inport blocks may reduce instances of rational approximation.

### **Chapter 3. Test Objectives Status**

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<b>Objectives</b>	Satisfied - No Test Case	6
Objectives	Unsatisfiable under Approximation	2

#### **Objectives Unsatisfiable**

Simulink Design Verifier found that there does not exist any test case exercising these test objectives. This often indicates the presence of dead logic in the model. Other possible reasons can be inactive blocks in the model due to parameter configuration or test constraints such as given using Test Condition blocks.

#	Туре	Model Item	Description	Analysis Time (sec)	Test Ca- se
23	Conditi- on	Controller/Tank1_Controller/Logical Operator	Logic: input port 1 <b>true</b>	8	n/a
28	Conditi- on	Controller/Tank1_Controller/Logical Operator1	Logic: input port 1 <b>false</b>	8	n/a
30	Conditi- on	Controller/Tank1_Controller/Logical Operator1	Logic: input port 2 <b>false</b>	8	n/a
33	Decisi- on	Controller/Tank1_Controller/Switch	logical trigger input false (output is from 3rd input port)	8	n/a
86	Conditi- on	Controller/Tank2_Controller/Logical Operator11	Logic: input port 1 <b>false</b>	8	n/a
102	Conditi- on	Controller/Tank2_Controller/Logical Operator8	Logic: input port 2 <b>false</b>	8	n/a

### **Objectives Undecided**

Simulink Design Verifier was not able to process these objectives with the current options.

#	Туре	Model Item	Description	Analys- is Time (sec)	Test Ca- se
52	Conditi- on	Environment/Sensor_HI Tank2/Relational Operator		-1	n/a
53	Decisi- on	Environment/Sensor_HI Tank2/Switch	logical trigger input false (output is from 3rd input port)	-1	n/a
56	Conditi- on	Environment/Sensor_MD Tank2/Relational Operator		-1	n/a

#	Туре	Model Item	Description	Analysis Time (sec)	Test Ca- se
57	Decisi- on	Environment/Sensor_MD Tank2/Switch	logical trigger input false (output is from 3rd input port)	-1	n/a
71	Conditi- on	Environment/Emergency- Valve/Relational Operator	RelationalOperator: inpu- t1 > input2 <b>true</b>	-1	n/a
76	Decisi- on	Environment/Emergency- Valve/Switch	logical trigger input true (output is from 1st input port)	-1	n/a
77	Conditi- on	Controller/Tank2_Controller/Compare To Constant-6/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	-1	n/a
79	Conditi- on	Controller/Tank2_Controller/Logical Operator13	Logic: input port 1 <b>true</b>	-1	n/a
82	Conditi- on	Controller/Tank2_Controller/Logical Operator12	Logic: input port 1 <b>false</b>	-1	n/a
91	Conditi- on	Controller/Compare To Constant4/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	-1	n/a
95	Conditi- on	Controller/Tank2_Controller/Compare To Constant-4/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	-1	n/a
97	Conditi- on	Controller/Tank2_Controller/Logical Operator9	Logic: input port 1 <b>true</b>	-1	n/a
100	Conditi- on	Controller/Tank2_Controller/Logical Operator8	Logic: input port 1 false	-1	n/a
103	Conditi- on	Controller/Tank2_Controller/Logical Operator10	Logic: input port 1 <b>true</b>	-1	n/a
105	Conditi- on	Controller/Tank2_Controller/Logical Operator10	Logic: input port 2 <b>true</b>	-1	n/a
108	Decisi- on	Controller/Tank2_Controller/Switch3	logical trigger input true (output is from 1st input port)	-1	n/a
111	Conditi- on	Controller/Tank2_Controller/Compare To Constant-2/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	-1	n/a
113	Conditi- on	Controller/Tank2_Controller/Logical Operator3	Logic: input port 1 <b>true</b>	-1	n/a
115	Conditi- on	Controller/Tank2_Controller/Logical Operator3	Logic: input port 2 <b>true</b>	-1	n/a
121	Conditi- on	Controller/Tank2_Controller/Logical Operator6	Logic: input port 2 <b>true</b>	-1	n/a
129	Conditi- on	Controller/Tank2_Controller/Logical Operator4	Logic: input port 2 <b>true</b>	-1	n/a

#	Туре	Model Item	Description	Analysis Time (sec)	Test Ca- se
132	Decisi- on	Controller/Tank2_Controller/Switch2	logical trigger input true (output is from 1st input port)	-1	n/a
133	Conditi- on	Controller/Compare To Constant5/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	-1	n/a
135	Conditi- on	Controller/Tank2_Controller/Logical Operator2	Logic: input port 1 <b>true</b>	-1	n/a
137	Conditi- on	Controller/Tank2_Controller/Logical Operator1	Logic: input port 1 <b>true</b>	-1	n/a
139	Conditi- on	Controller/Tank2_Controller/Logical Operator1	Logic: input port 2 <b>true</b>	-1	n/a
140	Conditi- on	Controller/Tank2_Controller/Logical Operator1	Logic: input port 2 <b>false</b>	-1	n/a
142	Decisi- on	Controller/Tank2_Controller/Switch	logical trigger input true (output is from 1st input port)	-1	n/a

### **Objectives Satisfied - No Test Case**

#	Туре	Model Item	Description	Analysis Time (sec)	Test Ca- se
1	Decisi- on	Initializer_and_Update- r/Initial_Height_Tank 1/Switch	trigger > threshold false (output is from 3rd input port)	299	n/a
2	Decisi- on	Initializer_and_Update- r/Initial_Height_Tank 1/Switch	trigger > threshold true (output is from 1st input port)	299	n/a
3	Conditi- on	Environment/Sensor_Low- _Tank1/Relational Operat- or	RelationalOperator: inpu- t1 > input2 <b>true</b>	299	n/a
4	Conditi- on	Environment/Sensor_Low- _Tank1/Relational Operat- or	RelationalOperator: inpu- t1 > input2 <b>false</b>	299	n/a
5	Decisi- on	Environment/Sensor_Low- _Tank1/Switch	logical trigger input false (output is from 3rd input port)	299	n/a
6	Decisi- on	Environment/Sensor_Low- _Tank1/Switch	logical trigger input true (output is from 1st input port)	299	n/a
7	Conditi- on	Controller/Compare To Constant1/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	299	n/a

#	Туре	Model Item	Description	Analysis Time (sec)	Test Ca- se
8	Conditi- on	Controller/Compare To Constant1/Compare	RelationalOperator: inpu- t1 == input2 <b>false</b>	299	n/a
9	Conditi- on	Controller/Tank1_Controller/Logical Operator2	Logic: input port 1 <b>true</b>	299	n/a
10	Conditi- on	Controller/Tank1_Controller/Logical Operator2	Logic: input port 1 <b>false</b>	299	n/a
11	Conditi- on	Environment/Sensor_Hig- h_Tank1/Relational Opera- tor	RelationalOperator: inpu- t1 > input2 <b>true</b>	299	n/a
12			RelationalOperator: inpu- t1 > input2 <b>false</b>	299	n/a
13	Decisi- Environment/Sensor_Hig- on h_Tank1/Switch		logical trigger input false (output is from 3rd input port)	299	n/a
14	Decisi- Environment/Sensor_Hig- on h_Tank1/Switch		logical trigger input true (output is from 1st input port)	299	n/a
15	Decisi- on	Initializer_and_Update-r/Valve_Initial_State/Swit-ch	trigger > threshold false (output is from 3rd input port)	299	n/a
16	on r/Valve_Initial_State/Swit-		trigger > threshold true (output is from 1st input port)	299	n/a
17	Decisi- on	Controller/Tank1_Controller/Switch3	logical trigger input false (output is from 3rd input port)	299	n/a
18	Decisi- on	Controller/Tank1_Controller/Switch3	logical trigger input true (output is from 1st input port)	299	n/a
19	Conditi- on	Controller/Compare To Constant/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	299	n/a
20	Conditi- on	Controller/Compare To Constant/Compare	RelationalOperator: inpu- t1 == input2 <b>false</b>	299	n/a
21	Decisi- on Controller/Tank1_Controll- on er/Switch2		logical trigger input false (output is from 3rd input port)	299	n/a
22	Decisi- on	Controller/Tank1_Controller/Switch2	logical trigger input true (output is from 1st input port)	299	n/a
24	Conditi- on	Controller/Tank1_Controller/Logical Operator	Logic: input port 1 <b>false</b>	299	n/a
25	Conditi- on	Environment/Pump/Relational Operator	RelationalOperator: inpu- t1 > input2 <b>true</b>	299	n/a

#	Туре	Model Item	Description	Analysis Time (sec)	Test Ca- se
26	Conditi- on	Environment/Pump/Relational Operator	RelationalOperator: inpu- t1 > input2 <b>false</b>	299	n/a
27	Conditi- on	Controller/Tank1_Controller/Logical Operator1	Logic: input port 1 <b>true</b>	299	n/a
29	Conditi- on	Controller/Tank1_Controller/Logical Operator1	Logic: input port 2 <b>true</b>	299	n/a
31	Decisi- on	Environment/Pump/Swit- ch	logical trigger input false (output is from 3rd input port)	299	n/a
32	Decisi- on	Environment/Pump/Swit- ch	logical trigger input true (output is from 1st input port)	299	n/a
34	Decisi- on	Controller/Tank1_Controller/Switch	logical trigger input true (output is from 1st input port)	299	n/a
35	Decisi- Initializer_and_Update- ton r/Pump_Initial_State/Swit-		trigger > threshold false (output is from 3rd input port)	299	n/a
37	Conditi- on	Environment/Valve/Relational Operator	RelationalOperator: inpu- t1 > input2 <b>true</b>	299	n/a
38	Conditi- on	Environment/Valve/Relational Operator	RelationalOperator: inpu- t1 > input2 <b>false</b>	299	n/a
39	Decisi- on	Environment/Valve/Switch	logical trigger input false (output is from 3rd input port)	299	n/a
40	Decisi- on	Environment/Valve/Switch	logical trigger input true (output is from 1st input port)	299	n/a
41	Decisi- on	Initializer_and_Update- r/Initial_Height_Tank _2/ Switch	trigger > threshold false (output is from 3rd input port)	299	n/a
42	Decisi- on	Initializer_and_Update- r/Initial_Height_Tank _2/ Switch	trigger > threshold true (output is from 1st input port)	299	n/a
43	Conditi- on	Environment/Sensor_LO Tank2/Relational Operator	RelationalOperator: inpu- t1 > input2 <b>true</b>	299	n/a
44	Conditi- on	Environment/Sensor_LO Tank2/Relational Operator	RelationalOperator: inpu- t1 > input2 <b>false</b>	299	n/a
45	Decisi- on	Environment/Sensor_LO Tank2/Switch	logical trigger input false (output is from 3rd input port)	299	n/a
46	Decisi- on	Environment/Sensor_LO Tank2/Switch	logical trigger input true (output is from 1st input port)	299	n/a

#	Туре	Model Item	Description	Analysis Time (sec)	Test Ca- se
47	Conditi- on	Controller/Compare To Constant6/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	299	n/a
48	Conditi- on	Controller/Compare To Constant6/Compare	RelationalOperator: inpu- t1 == input2 <b>false</b>	299	n/a
49	Conditi- on	Controller/Tank2_Controller/Logical Operator15	Logic: input port 1 <b>true</b>	299	n/a
50	Conditi- on	Controller/Tank2_Controll- er/Logical Operator15 Logic: input port 1 false		299	n/a
51	Conditi- on	Environment/Sensor_HI Tank2/Relational Operator   t1 > input2 <b>true</b>   2		299	n/a
54	Decisi- on	Decisi- Environment/Sensor_HI logical trigger input <b>true</b>		299	n/a
55	Conditi- on	Environment/Sensor_MD Tank2/Relational Operator	RelationalOperator: inpu- t1 > input2 <b>true</b>	299	n/a
58	Decisi- on	Environment/Sensor_MD Tank2/Switch	logical trigger input true (output is from 1st input port)	299	n/a
59	on er/Switch4 (ou		logical trigger input false (output is from 3rd input port)	299	n/a
60	Decisi- on	Controller/Tank2_Controller/Switch4	logical trigger input true (output is from 1st input port)	299	n/a
61	Decisi- on	Initializer_and_Update- r/E_Valve_Initial_State/Sw- itch	trigger > threshold false (output is from 3rd input port)	299	n/a
63	Conditi- on	Environment/Production- Valve/Relational Operator	RelationalOperator: inpu- t1 > input2 <b>true</b>	299	n/a
64	Conditi- on	Environment/Production- Valve/Relational Operator	RelationalOperator: input1 > input2 <b>false</b>	299	n/a
65	Decisi- on	Initializer_and_Update- r/P_Valve_Initial_State/Sw- itch	trigger > threshold false (output is from 3rd input port)	299	n/a
67	Decisi- on	Environment/Production- Valve/Switch	logical trigger input false (output is from 3rd input port)	299	n/a
68	Decisi- on	Environment/Production- Valve/Switch	logical trigger input true (output is from 1st input port)	299	n/a
69	Conditi- on	Controller/Tank2_Controller/Compare To Constant-7/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	299	n/a

#			Description	Analysis Time (sec)	Test Ca- se
70	Conditi- on	Controller/Tank2_Controller/Compare To Constant-7/Compare	RelationalOperator: inpu- t1 == input2 <b>false</b>	299	n/a
72	Conditi- on	Environment/Emergency- Valve/Relational Operator	RelationalOperator: inpu- t1 > input2 <b>false</b>	299	n/a
73	Conditi- on	Controller/Tank2_Controller/Logical Operator14	Logic: input port 1 <b>true</b>	299	n/a
74	Conditi- on	er/Logical Operator14		299	n/a
75	Decisi- on	Environment/Emergency- Valve/Switch	logical trigger input false (output is from 3rd input port)	299	n/a
78	Conditi- on	nditi- Controller/Tank2_Control- RelationalOperator: inpu-		299	n/a
80	Conditi- on	Controller/Tank2_Controller/Logical Operator13	Logic: input port 1 false	299	n/a
81	Conditi- on	Controller/Tank2_Controller/Logical Operator12	Logic: input port 1 <b>true</b>	299	n/a
83	Conditi- on	Controller/Tank2_Controller/Logical Operator12	Logic: input port 2 <b>true</b>	299	n/a
84	Conditi- on	Controller/Tank2_Controller/Logical Operator12	Logic: input port 2 <b>false</b>	299	n/a
85	Conditi- on	Controller/Tank2_Controller/Logical Operator11	Logic: input port 1 <b>true</b>	299	n/a
87	Conditi- on	Controller/Tank2_Controller/Logical Operator11	Logic: input port 2 <b>true</b>	299	n/a
88	Conditi- on	Controller/Tank2_Controller/Logical Operator11	Logic: input port 2 <b>false</b>	299	n/a
89	Decisi- on	Controller/Tank2_Controller/Switch1	logical trigger input false (output is from 3rd input port)	299	n/a
90	Decisi- on	Controller/Tank2_Controller/Switch1	logical trigger input true (output is from 1st input port)	299	n/a
92	Conditi- on	Controller/Compare To Constant4/Compare	RelationalOperator: inpu- t1 == input2 <b>false</b>	299	n/a
93	Conditi- on	Controller/Tank2_Controller/Compare To Constant-5/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	299	n/a
96	Conditi- on	Controller/Tank2_Controller/Compare To Constant-4/Compare	RelationalOperator: inpu- t1 == input2 <b>false</b>	299	n/a

#	Туре	Model Item	Description	Analysis Time (sec)	Test Ca- se
98	Conditi- on	Controller/Tank2_Controller/Logical Operator9	Logic: input port 1 false	299	n/a
99	Conditi- on	Controller/Tank2_Controller/Logical Operator8	Logic: input port 1 <b>true</b>	299	n/a
101	Conditi- on	Controller/Tank2_Controller/Logical Operator8	Logic: input port 2 <b>true</b>	299	n/a
104	Conditi- on	er/Logical Operator10		299	n/a
107	07 Decisi- on Controller/Tank2_Controll- on er/Switch3		logical trigger input false (output is from 3rd input port)	299	n/a
109	Conditi- on	Controller/Tank2_Controller/Compare To Constant-3/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	299	n/a
112	112 Conditi- Controller/Tank2_Control- I		RelationalOperator: inpu- t1 == input2 <b>false</b>	299	n/a
114	Conditi- on	Controller/Tank2_Controller/Logical Operator3	Logic: input port 1 false	299	n/a
118	Conditi- on	Controller/Tank2_Controller/Logical Operator7	Logic: input port 1 <b>false</b>	299	n/a
119	Conditi- on	Controller/Tank2_Controller/Logical Operator6	Logic: input port 1 <b>true</b>	299	n/a
122	Conditi- on	Controller/Tank2_Controller/Logical Operator6	Logic: input port 2 <b>false</b>	299	n/a
123	Conditi- on	Controller/Tank2_Controller/Compare To Constant-1/Compare	RelationalOperator: inpu- t1 == input2 <b>true</b>	299	n/a
124	Conditi- on	Controller/Tank2_Controller/Compare To Constant-1/Compare	RelationalOperator: inpu- t1 == input2 <b>false</b>	299	n/a
125	Conditi- on	Controller/Tank2_Controller/Logical Operator5	Logic: input port 1 <b>true</b>	299	n/a
126	Conditi- on	Controller/Tank2_Controller/Logical Operator5	Logic: input port 1 false	299	n/a
127	Conditi- on	Controller/Tank2_Controller/Logical Operator4	Logic: input port 1 <b>true</b>	299	n/a
128	Conditi- on	Controller/Tank2_Controller/Logical Operator4	Logic: input port 1 false	299	n/a
130	Conditi- on	Controller/Tank2_Controller/Logical Operator4	Logic: input port 2 <b>false</b>	299	n/a

#	Туре	Model Item	Description	Analysis Time (sec)	Test Ca- se
131			logical trigger input false (output is from 3rd input port)	299	n/a
134	Conditi- on	Controller/Compare To Constant5/Compare	RelationalOperator: inpu- t1 == input2 <b>false</b>	299	n/a
136	Conditi- on	Controller/Tank2_Controller/Logical Operator2	Logic: input port 1 <b>false</b>	299	n/a
138	8 Conditi- on Controller/Tank2_Controll- er/Logical Operator1		Logic: input port 1 <b>false</b>	299	n/a
141	Decisi- on	Controller/Tank2_Controller/Switch	logical trigger input false (output is from 3rd input port)	299	n/a

### Objectives Unsatisfiable under Approximation

Simulink Design Verifier found that there does not exist any test case exercising these test objectives under the impact of approximations during analysis. This often indicates the presence of dead logic in the model. Other possible reasons can be inactive blocks in the model due to parameter configuration or test constraints such as given using Test Condition blocks. In rare cases, the approximations performed by Simulink Design Verifier can make objectives impossible to achieve.

#	Туре	Model Item	Description	Analys- is Time (sec)	Test Ca- se
36	on r/Pump_Initial_State/Swit-		trigger > threshold <b>true</b> (output is from 1st input port)	19	n/a
62	on r/E_Valve_Initial_State/Sw- (c		trigger > threshold <b>true</b> (output is from 1st input port)	19	n/a
66	Decisi- on	Initializer_and_Update- r/P_Valve_Initial_State/Sw- itch	trigger > threshold <b>true</b> (output is from 1st input port)	19	n/a
94			RelationalOperator: inpu- t1 == input2 <b>false</b>	19	n/a
106	.06 Conditi- controller/Tank2_Controll- on er/Logical Operator10		Logic: input port 2 <b>false</b>	19	n/a
110	Conditi- on	Controller/Tank2_Controller/Compare To Constant-3/Compare	RelationalOperator: inpu- t1 == input2 <b>false</b>	19	n/a

#### Test Objectives Status

#	Туре	Model Item	Description	Analys- is Time (sec)	Test Ca- se
116	Conditi- on	Controller/Tank2_Controller/Logical Operator3	Logic: input port 2 <b>false</b>	19	n/a
117	Conditi- on	Controller/Tank2_Controller/Logical Operator7	Logic: input port 1 <b>true</b>	19	n/a
120	Conditi- on	Controller/Tank2_Controller/Logical Operator6	Logic: input port 1 <b>false</b>	19	n/a

### **Chapter 4. Model Items**

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This section presents, for each object in the model defining coverage objectives, the list of objectives and their individual status at the end of the analysis. It should match the coverage report obtained from running the generated test suite on the model, either from the harness model or by using the sldvruntest command.

### Initializer\_and\_Updater/Initial\_Height\_Tank\_1/Switch

#:	Туре	Description	Status	Test Case
1	Decision	trigger > threshold fal- se (output is from 3rd input port)	Satis- fied - No Te- st Case	n/a
2	Decision	trigger > threshold tr- ue (output is from 1st input port)	Satis- fied - No Te- st Case	n/a

# Environment/Sensor\_Low\_Tank1/Relational Operator

#:	Туре	Description	Status	Test Case
3	Condition		Satis- fied - No Te- st Case	n/a
4	Condition		Satis- fied - No Te- st Case	n/a

### Environment/Sensor\_Low\_Tank1/Switch

#:	Туре	Description	Status	Test Case
5	Decision	input port)	Satis- fied - No Te- st Case	n/a
6	Decision	ue (output is from 1st input port)	Satis- fied - No Te- st Case	n/a

### **Controller/Compare To Constant1/Compare**

#:	Туре	<b>Description</b> Statu	s Test Case
7	Condition	RelationalOperator: in- put1 == input2 true fied - No Te st Cas	<u>-</u>
8	Condition	RelationalOperator: in- put1 == input2 false fied - No Te st Cas	·-

#:	Туре	Description	Status	Test Case
9	Condition		Satis- fied - No Te- st Case	n/a
10	Condition	se	Satis- fied - No Te- st Case	n/a

# Environment/Sensor\_High\_Tank1/Relational Operator

#:	Туре	<b>Description</b> Stat	rus Test Case
11	Condition	RelationalOperator: in- put1 > input2 true fied No 7 st Ca	- Ге-
12	Condition	RelationalOperator: in- put1 > input2 false fied No 7 st Ca	- Ге-

### Environment/Sensor\_High\_Tank1/Switch

#:	Туре	Description	Status	Test Case
13	Decision	logical trigger input fa- lse (output is from 3rd input port)	Satis- fied - No Te- st Case	n/a
14	Decision		Satis- fied - No Te- st Case	n/a

### Initializer\_and\_Updater/Valve\_Initial\_State/Switch

#:	Туре	Description	Status	Test Case
15	Decision	trigger > threshold fal- se (output is from 3rd input port)	Satis- fied - No Te- st Case	n/a
16	Decision	trigger > threshold tr- ue (output is from 1st input port)	Satis- fied - No Te- st Case	n/a

#### Controller/Tank1\_Controller/Switch3

#:	Type	Description	Status	Test Case
17	Decision	input port)	Satis- fied - No Te- st Case	n/a
18	Decision	ue (output is from 1st input port)	Satis- fied - No Te- st Case	n/a

#### **Controller/Compare To Constant/Compare**

#:	Туре	<b>Description</b> State	rest Case
19	Condition	RelationalOperator: in- put1 == input2 true fied - No T st Ca	- e-
20	Condition	RelationalOperator: in- put1 == input2 false fied - No T st Ca	- e-

### Controller/Tank1\_Controller/Switch2

#:	Туре	Description	Status	Test Case
21	Decision	logical trigger input fa- lse (output is from 3rd input port)	Satis- fied - No Te- st Case	n/a
22	Decision	0 00 1	Satis- fied - No Te- st Case	n/a

#:	Type	Description	Status	Test Case
23	Condition	Logic: input port 1 true	Unsati- sfiable	n/a

#:	Туре	Description	Status	Test Case
24	Condition	Logic: input port 1 false	Satis- fied - No Te- st Case	n/a

### **Environment/Pump/Relational Operator**

#:	Type	<b>Description</b> Status	Test Case
25	Condition	RelationalOperator: in- put1 > input2 true fied - No Te- st Case	
26	Condition	RelationalOperator: in- put1 > input2 false No Te- st Case	

# Controller/Tank1\_Controller/Logical Operator1

#:	Туре	Description	Status	Test Case
27	Condition		Satis- fied - No Te- st Case	n/a
28	Condition	Logic: input port 1 false	Unsati- sfiable	n/a
29	Condition		Satis- fied - No Te- st Case	n/a
30	Condition	Logic: input port 2 false	Unsati- sfiable	n/a

### **Environment/Pump/Switch**

#:	Туре	Description	Status	Test Case
31	Decision	logical trigger input fa- lse (output is from 3rd input port)	Satis- fied -	n/a

#:	Туре	Description	Status	Test Case
			No Te- st Case	
32	Decision	input port)	Satis- fied - No Te- st Case	n/a

### Controller/Tank1\_Controller/Switch

#:	Туре	Description	Status	Test Case
33	Decision	logical trigger input fa- lse (output is from 3rd input port)		n/a
34	Decision	1 00 1	Satis- fied - No Te- st Case	n/a

### Initializer\_and\_Updater/Pump\_Initial\_State/Switch

#:	Туре	<b>Description</b> S	Status	Test Case
35	Decision	se (output is from 3rd input port)	Satis- fied - No Te- st Case	n/a
36	Decision	ue (output is from 1st input port)	Unsati- sfiable under appro- ximat- ion	n/a

### **Environment/Valve/Relational Operator**

#:	Туре	<b>Description</b> Status	Test Case
37	Condition	RelationalOperator: in- put1 > input2 true fied - No Te- st Case	

#:	Туре	Description	Status	Test Case
38	Condition	RelationalOperator: in- put1 > input2 false	Satis- fied - No Te- st Case	n/a

#### **Environment/Valve/Switch**

#:	Туре	<b>Description</b> State	us Test Case
39	Decision	logical trigger input false (output is from 3rd input port)  Satisfied No T	- 'e-
40	Decision	logical trigger input true (output is from 1st input port)  No T st Ca	- 'e-

# Initializer\_and\_Updater/Initial\_Height\_Tank \_2/Switch

#:	Туре	Description	Status	Test Case
41	Decision	trigger > threshold fal- se (output is from 3rd input port)	Satis- fied - No Te- st Case	n/a
42	Decision	trigger > threshold tr- ue (output is from 1st input port)	Satis- fied - No Te- st Case	n/a

# Environment/Sensor\_LO\_Tank2/Relational Operator

#:	Туре	<b>Description</b> St	tatus	Test Case
43	Condition	No.	atis- ed - o Te- Case	n/a
44	Condition	RelationalOperator: in- Sa put1 > input2 false fie	atis- ed -	n/a

#:	Type	Description	Status	Test Case
			No Te-	
			st Case	

### Environment/Sensor\_LO\_Tank2/Switch

#:	Туре	<b>Description</b> S	Status	Test Case
45	Decision	input port)	Satis- fied - No Te- st Case	n/a
46	Decision	ue (output is from 1st input port)	Satis- fied - No Te- st Case	n/a

### **Controller/Compare To Constant6/Compare**

#:	Туре	<b>Description</b> Sta	tus T	Test Case
47	Condition			n/a
48	Condition			n/a

#:	Туре	Description	Status	Test Case
49	Condition		Satis- fied - No Te- st Case	n/a
50	Condition	se i	Satis- fied - No Te- st Case	n/a

# Environment/Sensor\_HI\_Tank2/Relational Operator

#:	Type	<b>Description</b> S	Status	Test Case
51	Condition		Satis- fied - No Te- st Case	n/a
52	Condition	RelationalOperator: in- put1 > input2 false	Undec- ided	n/a

#### Environment/Sensor\_HI\_Tank2/Switch

#:	Туре	Description	Status	Test Case
53	Decision	logical trigger input fa- lse (output is from 3rd input port)		n/a
54	Decision		Satis- fied - No Te- st Case	n/a

# Environment/Sensor\_MD\_Tank2/Relational Operator

#:	Туре	<b>Description</b> Sta	tus	Test Case
55	Condition		I	n/a
56	Condition	RelationalOperator: in- put1 > input2 false ide		n/a

#### Environment/Sensor\_MD\_Tank2/Switch

#:	Туре	<b>Description</b> Status	Test Case
57	Decision	logical trigger input false (output is from 3rd ided	- n/a
		input port)	

#:	Type	<b>Description</b> St	atus	Test Case
58	Decision	input port) No	ntis- ed - o Te- Case	n/a

### Controller/Tank2\_Controller/Switch4

#:	Туре	<b>Description</b> Statu	s Test Case
59	Decision	logical trigger input fa- lse (output is from 3rd input port) No Te st Cas	
60	Decision	logical trigger input true (output is from 1st input port)  No Test Cas	

### Initializer\_and\_Updater/E\_Valve\_Initial\_State/Switch

#:	Type	Description	Status	Test Case
61	Decision	trigger > threshold fal- se (output is from 3rd input port)	Satis- fied - No Te- st Case	n/a
62	Decision	trigger > threshold tr- ue (output is from 1st input port)	Unsati- sfiable under appro- ximat- ion	n/a

# Environment/ProductionValve/Relational Operator

#:	Туре	<b>Description</b> Status	Test Case
63	Condition	RelationalOperator: in- put1 > input2 true fied - No Te- st Case	

#:	Туре	Description	Status	Test Case
64	Condition	RelationalOperator: in- put1 > input2 false	Satis- fied - No Te- st Case	n/a

### Initializer\_and\_Updater/P\_Valve\_Initial\_State/Switch

#:	Туре	Description	Status	Test Case
65	Decision	se (output is from 3rd input port)	Satis- fied - No Te- st Case	n/a
66	Decision	ue (output is from 1st input port)	Unsati- sfiable under appro- ximat- ion	n/a

#### **Environment/ProductionValve/Switch**

#:	Туре	Description	Status	Test Case
67	Decision	input port)	Satis- fied - No Te- st Case	n/a
68	Decision	ue (output is from 1st input port)	Satis- fied - No Te- st Case	n/a

# Controller/Tank2\_Controller/Compare To Constant7/Compare

#:	Туре	<b>Description</b> Status	Test Case
69	Condition	RelationalOperator: in- put1 == input2 true fied - No Te- st Case	

#:	Туре	Description	Status	Test Case
70	Condition	RelationalOperator: in- put1 == input2 false	Satis- fied - No Te- st Case	n/a

# Environment/EmergencyValve/Relational Operator

#:	Type	<b>Description</b> Status	Test Case
71	Condition	RelationalOperator: in- put1 > input2 true ided	n/a
72	Condition	RelationalOperator: in- put1 > input2 false fied - No Te- st Case	

### Controller/Tank2\_Controller/Logical Operator14

#:	Type	Description	Status	Test Case
73	Condition		Satis- fied - No Te- st Case	n/a
74	Condition	se f	Satis- fied - No Te- st Case	n/a

### **Environment/EmergencyValve/Switch**

#:	Туре	Description	Status	Test Case
75	Decision	input port)	Satis- fied - No Te- st Case	n/a
76	Decision	logical trigger input tr- ue (output is from 1st input port)	Undec- ided	n/a

# Controller/Tank2\_Controller/Compare To Constant6/Compare

#:	Туре	<b>Description</b> Stat	us Test Case
77	Condition	RelationalOperator: in- put1 == input2 true ided	
78	Condition	RelationalOperator: in- put1 == input2 false fied No T st Ca	- 'e-

### Controller/Tank2\_Controller/Logical Operator13

#:	Type	<b>Description</b> Status	Test Case
79	Condition	Logic: input port 1 true   Undecided	n/a
80	Condition	Logic: input port 1 fal- se fied - No Te- st Case	

#:	Туре	Description	Status	Test Case
81	Condition		Satis- fied - No Te- st Case	n/a
82	Condition		Undec- ided	n/a
83	Condition		Satis- fied - No Te- st Case	n/a
84	Condition	se	Satis- fied - No Te- st Case	n/a

# Controller/Tank2\_Controller/Logical Operator11

#:	Туре	Description	Status	Test Case
85	Condition		Satis- fied - No Te- st Case	n/a
86	Condition	0 1 1	Unsati- sfiable	n/a
87	Condition		Satis- fied - No Te- st Case	n/a
88	Condition	se	Satis- fied - No Te- st Case	n/a

### Controller/Tank2\_Controller/Switch1

#:	Туре	Description	Status	Test Case
89	Decision	input port)	Satis- fied - No Te- st Case	n/a
90	Decision	ue (output is from 1st input port)	Satis- fied - No Te- st Case	n/a

### **Controller/Compare To Constant4/Compare**

#:	Туре	<b>Description</b> Status	Test Case
91	Condition	RelationalOperator: in- put1 == input2 true ided	n/a
92	Condition	RelationalOperator: in- put1 == input2 false fied - No Te- st Case	

# Controller/Tank2\_Controller/Compare To Constant5/Compare

#:	Туре	Description	Status	Test Case
93	Condition	put1 == input2 true	Satis- fied - No Te- st Case	n/a
94	Condition		Unsati- sfiable under appro- ximat- ion	n/a

# Controller/Tank2\_Controller/Compare To Constant4/Compare

#:	Туре	Description	Status	Test Case
95	Condition	RelationalOperator: in- put1 == input2 true	Undec- ided	n/a
96	Condition	RelationalOperator: in- put1 == input2 false	Satis- fied - No Te- st Case	n/a

#:	Туре	<b>Description</b> Status	Test Case
97	Condition	Logic: input port 1 true Undec	r- n/a
98	Condition	Logic: input port 1 fal- se fied - No Te st Case	

# Controller/Tank2\_Controller/Logical Operator8

#:	Type	Description	Status	Test Case
99	Condition		Satis- fied - No Te- st Case	n/a
100	Condition		Undec- ided	n/a
101	Condition		Satis- fied - No Te- st Case	n/a
102	Condition		Unsati- sfiable	n/a

# Controller/Tank2\_Controller/Logical Operator10

#:	Type	Description	Status	Test Case
103	Condition	Logic: input port 1 true i	Undec- ided	n/a
104	Condition	se 1	Satis- fied - No Te- st Case	n/a
105	Condition	Logic: input port 2 true i	Undec- ided	n/a
106	Condition	se s	Unsati- sfiable under appro- ximat- ion	n/a

### Controller/Tank2\_Controller/Switch3

#:	Туре	Description	Status	Test Case
107	Decision	logical trigger input fa- lse (output is from 3rd input port)	Satis- fied -	n/a

#:	Туре	Description	Status	Test Case
			No Te- st Case	
108	Decision	logical trigger input tr- ue (output is from 1st input port)	Undec- ided	n/a

# Controller/Tank2\_Controller/Compare To Constant3/Compare

#:	Туре	<b>Description</b> Status	Test Case
109	Condition	RelationalOperator: in- put1 == input2 true fied - No Te- st Case	
110	Condition	RelationalOperator: in- put1 == input2 false sfiable under appro- ximat- ion	

# Controller/Tank2\_Controller/Compare To Constant2/Compare

#:	Type	<b>Description</b> Statu	s Test Case
111	Condition	RelationalOperator: in- put1 == input2 true ided	c- n/a
112	Condition	RelationalOperator: in- put1 == input2 false fied - No Te st Cas	<b>!-</b>

#:	Туре	Description	Status	Test Case
113	Condition	Logic: input port 1 true	Undec- ided	n/a
114	Condition		Satis- fied -	n/a

#:	Туре	Description	Status	Test Case
			No Te- st Case	
115	Condition	Logic: input port 2 true	Undec- ided	n/a
116	Condition	Logic: input port 2 false	Unsati- sfiable under appro- ximat- ion	n/a

### Controller/Tank2\_Controller/Logical Operator7

#:	Type	Description	Status	Test Case
117	Condition		Unsati- sfiable under appro- ximat- ion	n/a
118	Condition	Logic: input port 1 false	Satis- fied - No Te- st Case	n/a

#:	Туре	<b>Description</b> Sta	atus	Test Case
119	Condition	No	itis- ed - o Te- Case	n/a
120	Condition	se sfi. un ap	nsati- iable nder opro- mat- n	n/a
121	Condition	Logic: input port 2 true Un		n/a

#:	Type	Description	Status	Test Case
122	2 Condition	se	Satis- fied - No Te- st Case	n/a

# Controller/Tank2\_Controller/Compare To Constant1/Compare

#:	Туре	Description	Status	Test Case
123	Condition	RelationalOperator: in- put1 == input2 true	Satis- fied - No Te- st Case	n/a
124	Condition	RelationalOperator: in- put1 == input2 false	Satis- fied - No Te- st Case	n/a

# Controller/Tank2\_Controller/Logical Operator5

#:	Туре	Description	Status	Test Case
125	Condition	I	Satis- fied - No Te- st Case	n/a
126	Condition	se f	Satis- fied - No Te- st Case	n/a

#:	Туре	<b>Description</b> Star	tus Test Case
127	Condition	Logic: input port 1 true Sati fied No ' st C	- Ге-

#:	Type	<b>Description</b> S	Status	Test Case
128	Condition	se fi	Satis- ïed - No Te- st Case	n/a
129	Condition	Logic: input port 2 true U	Jndec- ded	n/a
130	Condition	se fi	Satis- ïed - No Te- st Case	n/a

### Controller/Tank2\_Controller/Switch2

#:	Туре	Description	Status	Test Case
131	Decision	logical trigger input fa- lse (output is from 3rd input port)		n/a
132	Decision	logical trigger input tr- ue (output is from 1st input port)	Undec- ided	n/a

### **Controller/Compare To Constant5/Compare**

#:	Type	<b>Description</b> State	ıs Test Case
133	Condition	RelationalOperator: in- put1 == input2 true ided	ec- n/a
134	Condition	RelationalOperator: in- put1 == input2 false fied No T st Ca	- e-

#:	Туре	Description	Status	Test Case
135	Condition	Logic: input port 1 true	Undec- ided	n/a
136	Condition		Satis- fied -	n/a

#:	Туре	Description	Status	Test Case
			No Te-	
			st Case	

# Controller/Tank2\_Controller/Logical Operator1

#:	Type	Description	Status	Test Case
137	Condition	Logic: input port 1 true	Undec- ided	n/a
138	Condition	se	Satis- fied - No Te- st Case	n/a
139	Condition	Logic: input port 2 true	Undec- ided	n/a
140	Condition		Undec- ided	n/a

### Controller/Tank2\_Controller/Switch

#:	Туре	Description	Status	Test Case
141	Decision	input port)	Satis- fied - No Te- st Case	n/a
142	Decision	logical trigger input tr- ue (output is from 1st input port)	Undec- ided	n/a