



Exploration & Production

GENERAL SPECIFICATION

INSTRUMENTATION

GS INS 190

**Deluge System
standard function
- DELUGE -**

00	11/03	Fist issue
Rev.	Date	Notes



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1. Scope

The purpose of this document is to define the Standard Function of a deluge system.

In order to assist in understanding, the document should be read in conjunction with **GS INS 150**, Design Methods for System Configuration Standard Functions.

The standard function covers the following deluge systems:

- water system (DELUGE)
- water with foam injection (DELUGE_FOAM)
- water curtains (DELUGE_CURTAIN)

This Standard Function is normally linked to other Standard Functions (e.g. Safety analogue input AIS and Voting logic 2ooN).

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
Not applicable	

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	



Total General Specifications

Reference	Title
GS INS 150	Design Method for System Configuration Standard Functions

3. General description of functions

3.1 List of main functions

- Activation including discrepancy detection
- Field interface including loop fault detection
- Test function

4. Interfaces description

4.1 General description

INPUTS				OUTPUTS		
Field	HMI	Internal		Internal	HMI	Field
			<i>AIS or Voting logic</i>			

4.2 Specific description of field interfaces

This Standard Function handles directly its own field inputs and outputs, except for the RPT1 input which will use the AIS Standard Function, since it is also processed by the ESD logic.

- the solenoid valve RY1 (DO provided with output line monitoring facility); logic will be as per:
1 = Open for deluge system with or without foam
0 = Open for water curtain
- the solenoid valve RY3 (DO provided with output line monitoring facility); logic will be as per:
1 = Open for deluge system with foam
- local indication on the F&G matrix panel :
1 = Release

Specific inputs are :

- RPT2 (water pressure downstream the deluge valve) used to confirm the release
< 8 mA = NORMAL
- RZH limit switch of the foam valve
1 = Open

5. Detailed description of functions

5.1 Activation command

5.1.1 Deluge valve

The open command of the deluge valve is activated by the low pressure of the fusible loop.

RPT1 (fusible loop) is used to automatically activate the deluge (with the threshold setting: <8mA = Initiate Deluge). The AIS Standard Function will handle this condition.

The close command of the deluge valve is only activated by the operator (release reset command from HMI).

5.1.2 Water curtain valve

The open command of the water curtain valve is activated by the voting logic of gas detection of the protected area (as per project fire and gas cause and effect matrix)

The close command of the water curtain valve is only activated by the operator (release reset command from HMI).

5.1.3 Foam valve (option)

The open command of the foam valve is activated when the open command of the deluge valve is activated.

The close command of the foam valve is only activated by the operator (command from HMI).

5.2 Test command

For each DELUGE system a dedicated screen target located on the geographical representation mimic of the fire detection zones shall give access to the test function. This access shall be in maintenance access level.

A double confirmation (processed at HMI level) is required to verify the operator is fully aware a test is going to be performed.

This test command will activate the open deluge valve command.

5.3 Standard functional behaviour

5.3.1 Operating command status :

5.3.1.1 Deluge / Water curtain valve

Deluge command status results from deluge open / close command or test command.

5.3.1.2 Foam valve (option)

Foam command status results from foam open / close command or test command.

5.3.2 Status

5.3.2.1 Deluge release status

Active when RPT2 high pressure > 8mA

5.3.2.2 Foam open status (optional)

Active when open limit switch is active.

5.3.2.3 Discrepancy status

Deluge discrepancy status

Discrepancy between deluge command status and the RPT2 threshold status after a time delay.

Foam Discrepancy status (optional)

Discrepancy between foam command status and the open limit switch of the foam valve after a time delay.

5.3.2.4 Fault status

Hardware fault concerning DI/DO cards or faulty AI (RPT2) signal.

5.3.3 Activation counter

This function shall be handled at the DCS level.

This reports the number of changes of status of the activation command (from close to open) since the last reset command.

6. Tuning parameters and variables

PARAMETERS	ACCESS LEVEL
Pre-set value of discrepancy timer for the deluge valve	Method
Pre-set value of discrepancy timer for the foam valve	Method

7. Representation and animation description (HMI)

7.1 Events and values to be recorded

Events

- Test command
- Test validation
- Open and close foam valve command (optional)
- Deluge command Status
- Deluge discrepancy Status
- Foam command status (optional)
- Foam discrepancy status (optional)
- Fault status

Values

- Counter of deluge activation (to be recorded by the DCS)
- Counter of foam activation (to be recorded by the DCS)

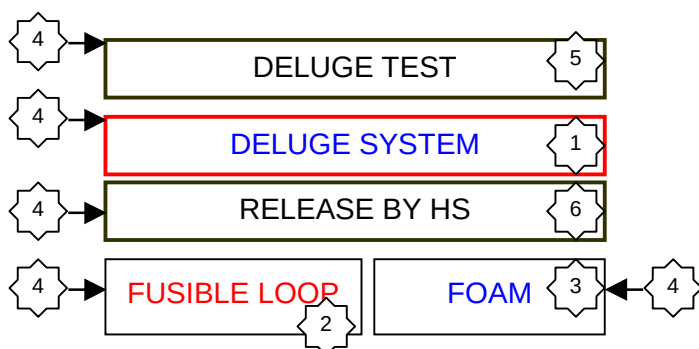
7.2 Alarm handling

Alarm Description	Priority
Release discrepancy alarm	Level 3
Foam discrepancy alarm(optional)	Level 3
Fusible loop low pressure alarm	Level 3
Fault alarm	Level 3

7.3 Control display

As a general rule all alarmed signals are flashing prior to acknowledgement.

7.3.1 Deluge with foam display

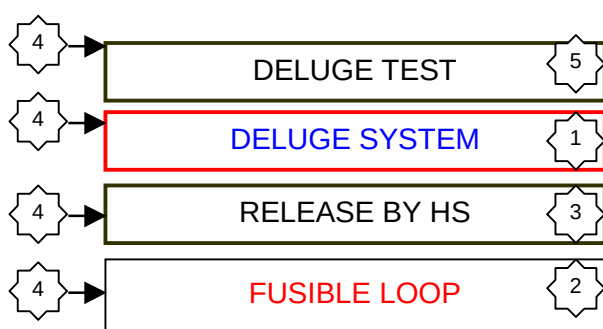


Data animation tables

N°	Display description	Display	Colour
1	Deluge activation = NOT ACTIVE Deluge activation command = ACTIVE Release status = ACTIVE Release discrepancy = ACTIVE Used as target area of reset of release command	DELUGE SYSTEM DELUGE SYSTEM DELUGE SYSTEM DELUGE SYSTEM	White Blue Blue steady Red
2	Fusible loop detection = ACTIVE Fusible loop detection = NORMAL (except for water curtain)	FUSIBLE LOOP FUSIBLE LOOP	Red Blue
3	Foam = ACTIVE Foam valve = OPEN Foam valve = CLOSED Foam valve discrepancy = ACTIVE Used as target area of foam close/open command	FOAM FOAM FOAM	Magenta (flashing) Magenta White Red
4	Fault = ACTIVE Fault = NOT ACTIVE		Red Hidden

N°	Display description	Display	Colour
5	Test Deluge command = NOT ACTIVE Test Deluge command = ACTIVE Used as target area for the testing command	DELUGE TEST DELUGE TEST	White Yellow (Flashing)
6	PUSH BUTTON = NOT ACTIVE PUSH BUTTON = ACTIVE	RELEASE BY HS RELEASE BY HS	Blue Red

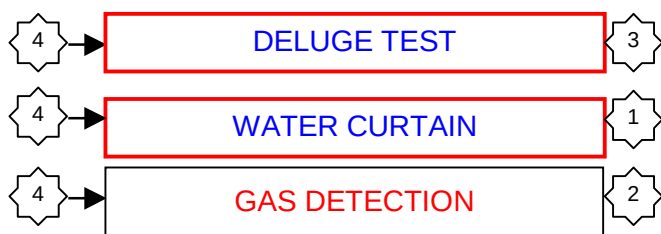
7.3.2 Deluge without foam display



N°	Display description	Display	Colour
1	Deluge activation = NOT ACTIVE Deluge activation = ACTIVE Release status = ACTIVE Release discrepancy = ACTIVE Used as target area of reset release command	DELUGE SYSTEM DELUGE SYSTEM DELUGE SYSTEM DELUGE SYSTEM	White Blue Blue steady Red
2	Fusible detection = ACTIVE Fusible detection = NORMAL (except for water curtain)	FUSIBLE LOOP FUSIBLE LOOP	Red Blue

N°	Display description	Display	Colour
3	PUSH BUTTON = NOT ACTIVE	RELEASE BY HS	Blue
	PUSH BUTTON= ACTIVE	RELEASE BY HS	Red
4	Fault = ACTIVE		Red
	Fault = NOT ACTIVE		Hidden
5	Test Deluge command = NOT ACTIVE	DELUGE TEST	White
	Test Deluge command = ACTIVE <i>Used as target area of the testing command</i>	DELUGE TEST	Yellow (Flashing)

7.3.3 Water curtain display



Data animation tables

N°	Display description	Display	Colour
1	Deluge command = NOT ACTIVE	WATER CURTAIN	White
	Deluge command = ACTIVE	WATER CURTAIN	Blue
	Release status = ACTIVE	WATER CURTAIN	Blue steady
	Released discrepancy = ACTIVE	WATER CURTAIN	Red
	<i>Used as target area of reset release command</i>		
2	Gas detection = ACTIVE	GAS DETECTION	Red

N°	Display description	Display	Colour
	Gas detection = NORMAL	GAS DETECTION	Blue
4	Fault = ACTIVE		Red
	Fault = NOT ACTIVE		Hidden
3	Test Deluge command = NOT ACTIVE	DELUGE TEST	White
	Test Deluge command = ACTIVE	DELUGE TEST	Yellow (Flashing)
	Used as target area of the test command		