BODY REFERENCE: WP4/A5A6/REV.A

TITLE:	SPECIFICATION OF EDP FUNCTIONS: "QUANTIFY FAILURE VALUE (A5)", "ANALYSE CONSEQUENCES OF FAILURE TO THE SYSTEM (A6)"
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PREFACE

This document contains a description of the maintenance functions "Quantify failure value"(A5) and "Analyse consequences of failure to the subsystem and system" (A6).

1. OBJECTIVE OF FUNCTIONS

The function(s) provides the failure value quantification (which reveals the ability of the faulty sub-item to perform its function), and system (subsystem) state caused by the faulty sub-item.

The functions task is to quantify the failure value in accordance with IEC 50-191-04 and to evaluate the final state of the system and subsystem, from the incidents inventory table.

2. FUNCTION ENVIRONMENT

The function is a part of the analysis/decision (consequence analyse) maintenance domain. The function is activated on operator request or automatically after the identification of the faulty sub-item.

The sequence of requests and responses necessary to utilise the function is the following.

Event	Request/Response (RQ/RS)	From	To
Trigger	RQ	Maintenance operator (MO) or function D1	Function
Perform failure value quantification and consequence analyse	RQ	Function	Incidents Inventory Table
Operating time between failures	RQ	Function	Control System Database or Function
Operating time between failures	RS	Control System Database or Function	Function
Time between failures and number of failures	RQ	Function	Maintenance Database
Display failure value, state of the subsystem and system and relevant times	RS	Function	MO

Event	Request/Response (RQ/RS)	From	To
Improvement of the Incidents Inventory Table	RQ	Function	MO
Improvement of the Incidents Inventory Table	RS	MO	Function

3. INPUT DATA DEFINITION

Configured data:

identification table

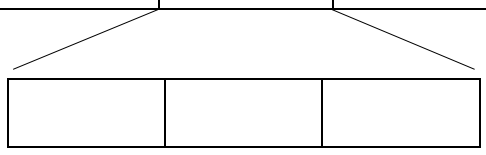
Data with the following identifiers:

Datalabel	parameter	subcomponent/component	subsystem/system

Incidents inventory table

Data with the following identifiers:

Datalabel	failure value	subcomponent/component state	subsystem/system state

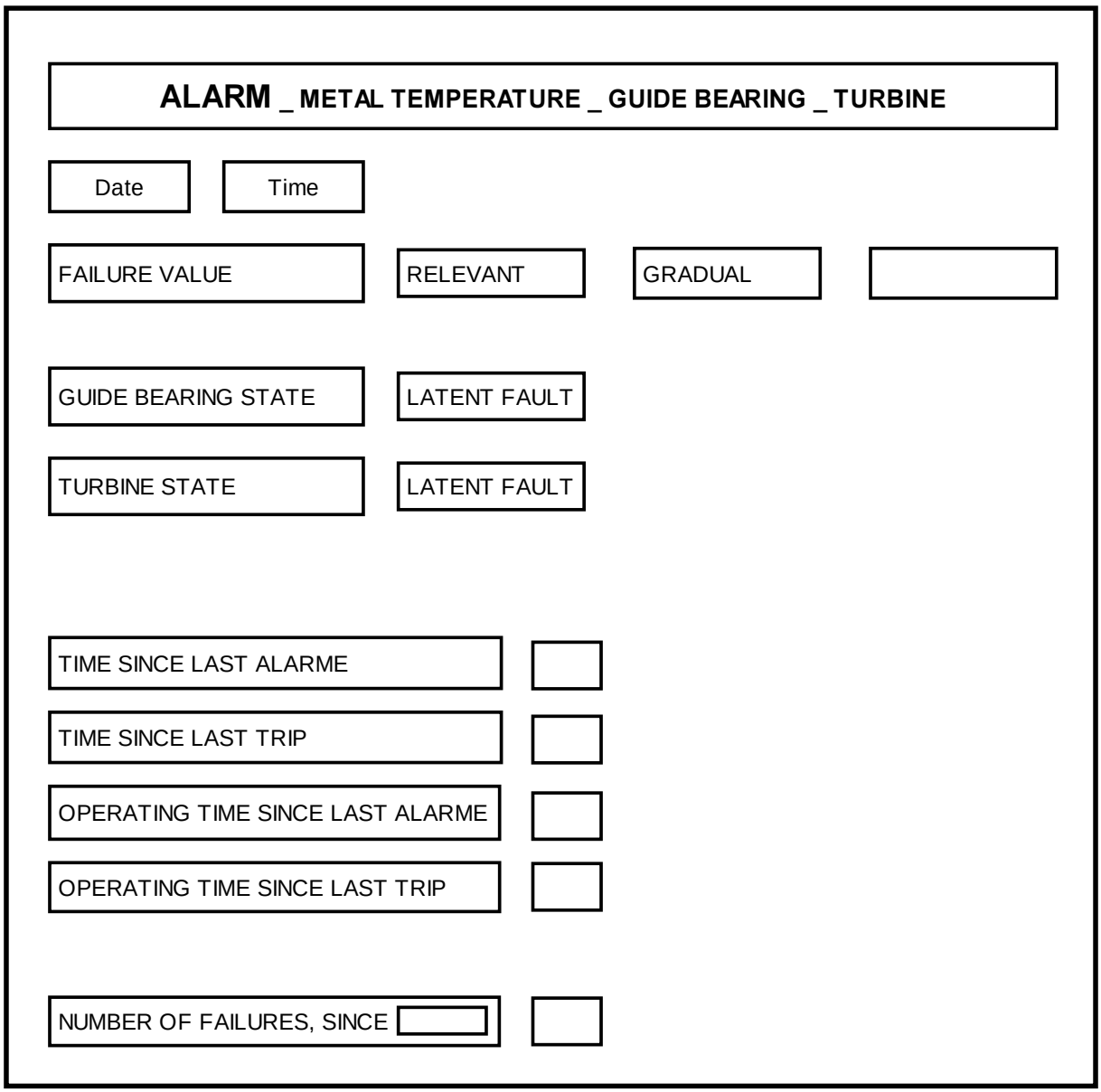


Calculated data:

- Operating time since last alarm of ...
- Operating time since last trip of ...
- Time since last alarm of ...
- Time since last alarm of ...

4. OUTPUT DATA DEFINITION

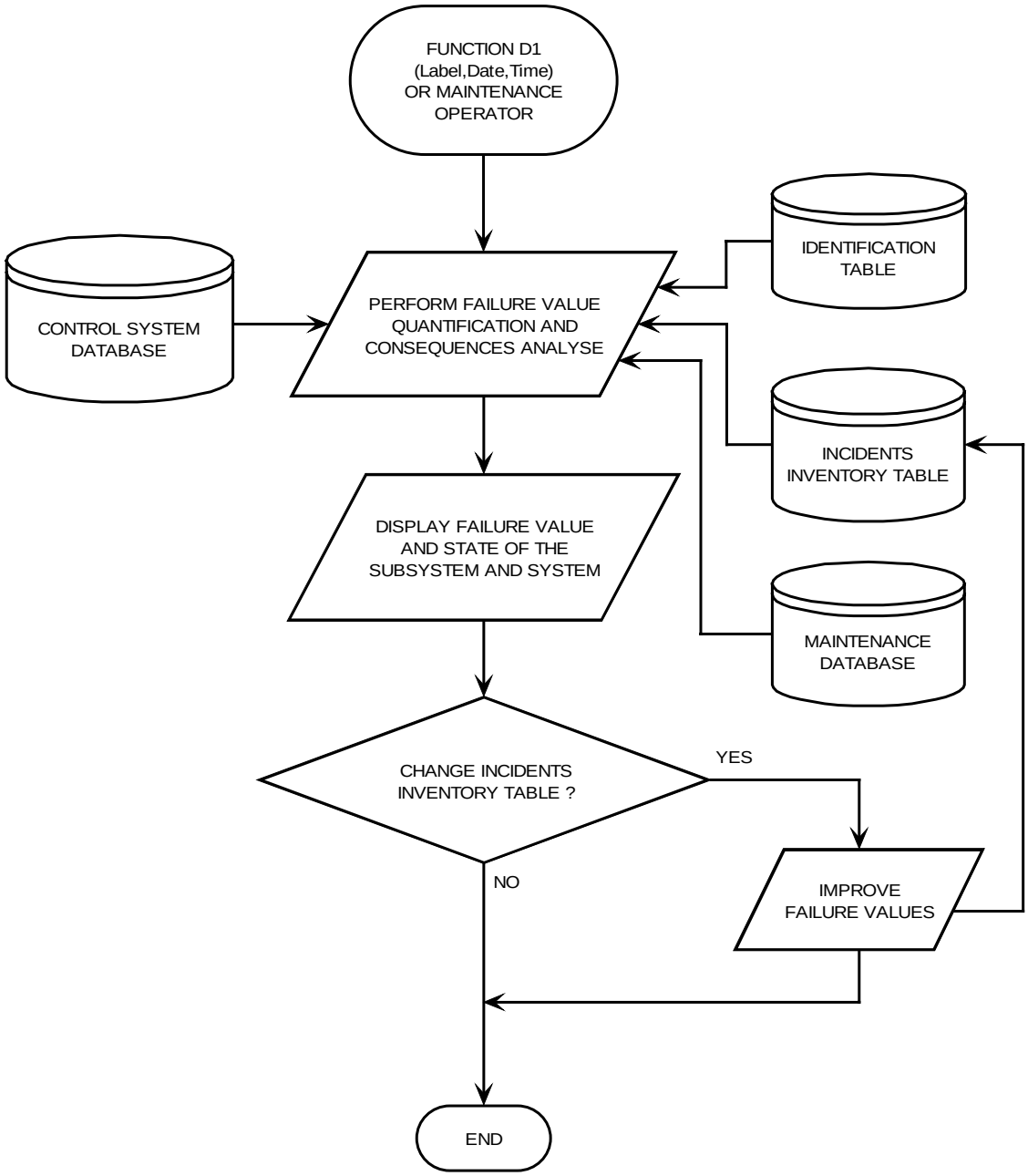
Output from function:



5. DYNAMIC BEHAVIOUR

The function is triggered by the identification of the faulty sub-item provided by the function "D1-Identify and display fault localisation".

6. DATA PROCESSING (ALGORITHM)



7. INTERFACES

The output to the display must be shown locally and remotely.

8. ERROR MANAGEMENT

Display messages describing the cause of the error or fault: internal error, missing data,... .

9. CONSTRAINTS

Existence of an incidents inventory table, with the following structure:

Data label	Failure value (1)			subcomponent/component state (2)	subsystem/system state (2)

(1) Failure values in accordance with the IEC-50-191:

- Critical or non-critical;
- Sudden or gradually;
- Relevant or non-relevant;
- Complete or partial;
- Degradation (gradual and partial).

(2) State values of the subcomponent/component and subsystem/system:

- Latent fault;
- Disable.

The table must be filled up taking into account the specific characteristics of each experimentation site.

10. HARDWARE AND SOFTWARE REQUIREMENTS

The function can be implemented using a standard PC hardware.

The output display should be of the SVGA type and able of presenting colour information.

11. TEST PLAN

The error's cause simulation must be possible.

12. REFERENCES

[1] IEC 50-191: International Electrotechnical Vocabulary – Dependability and quality of service

[2] Hydroelectric Set Structuring (EDP/019/REV.B)

[3] Distributed Maintenance Data Needs (Deliverable 3.1)