



Proposal for New AddCause Values

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Background and Purpose

◆ Background

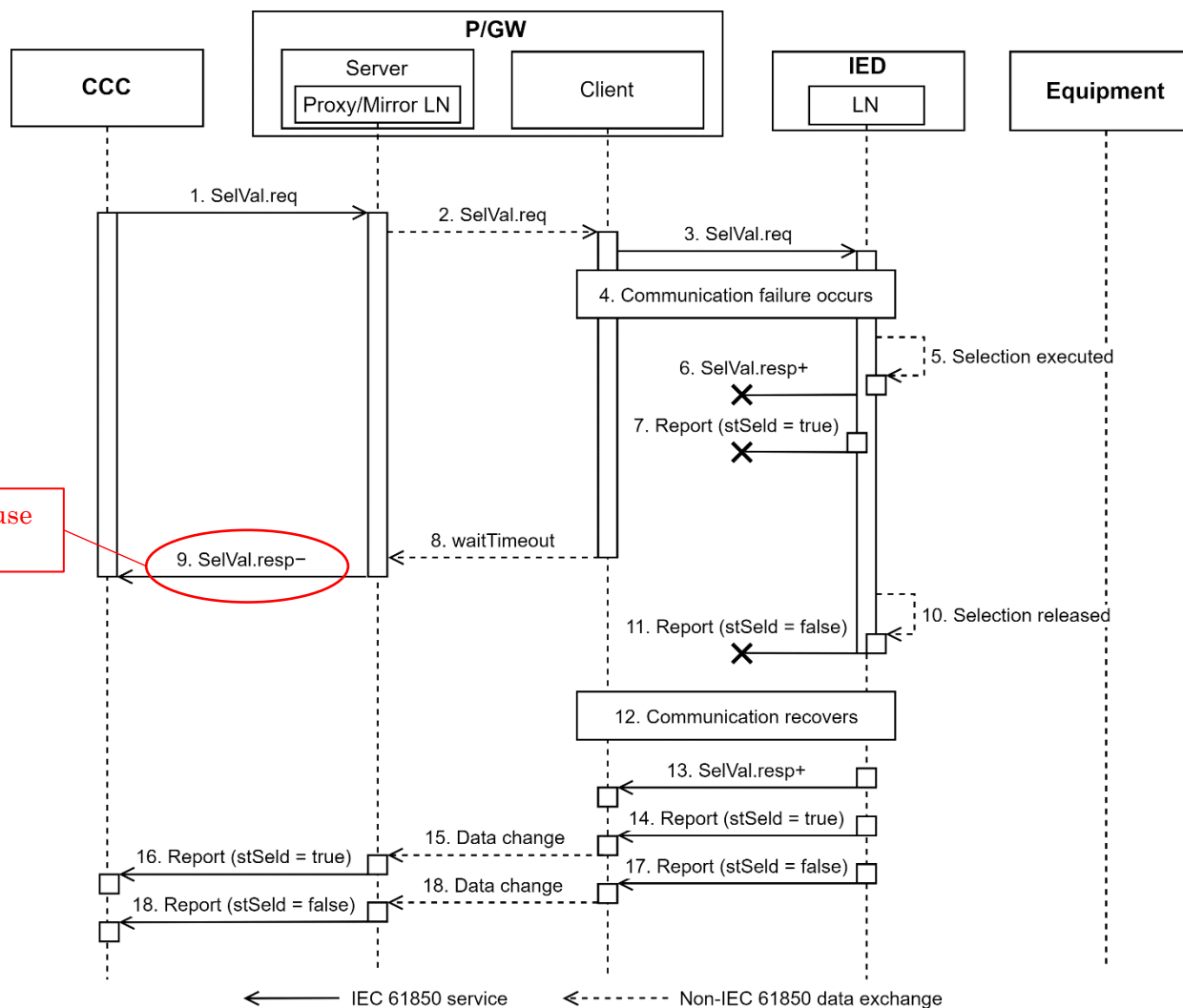
- After P/GW (Proxy/Gateway) received SelVal/Oper.req from CCC (Control Center Client) and sent it to IED, P/GW sends response– to CCC without receiving response from IED in such cases that
 - IED does not respond due to communication failure (within a few seconds to tens of seconds), IED failure, and so on,
 - Association is lost between P/GW and IED.
- However, appropriate AddCause value to be put into response– is not defined in IEC 61850.

◆ Purpose

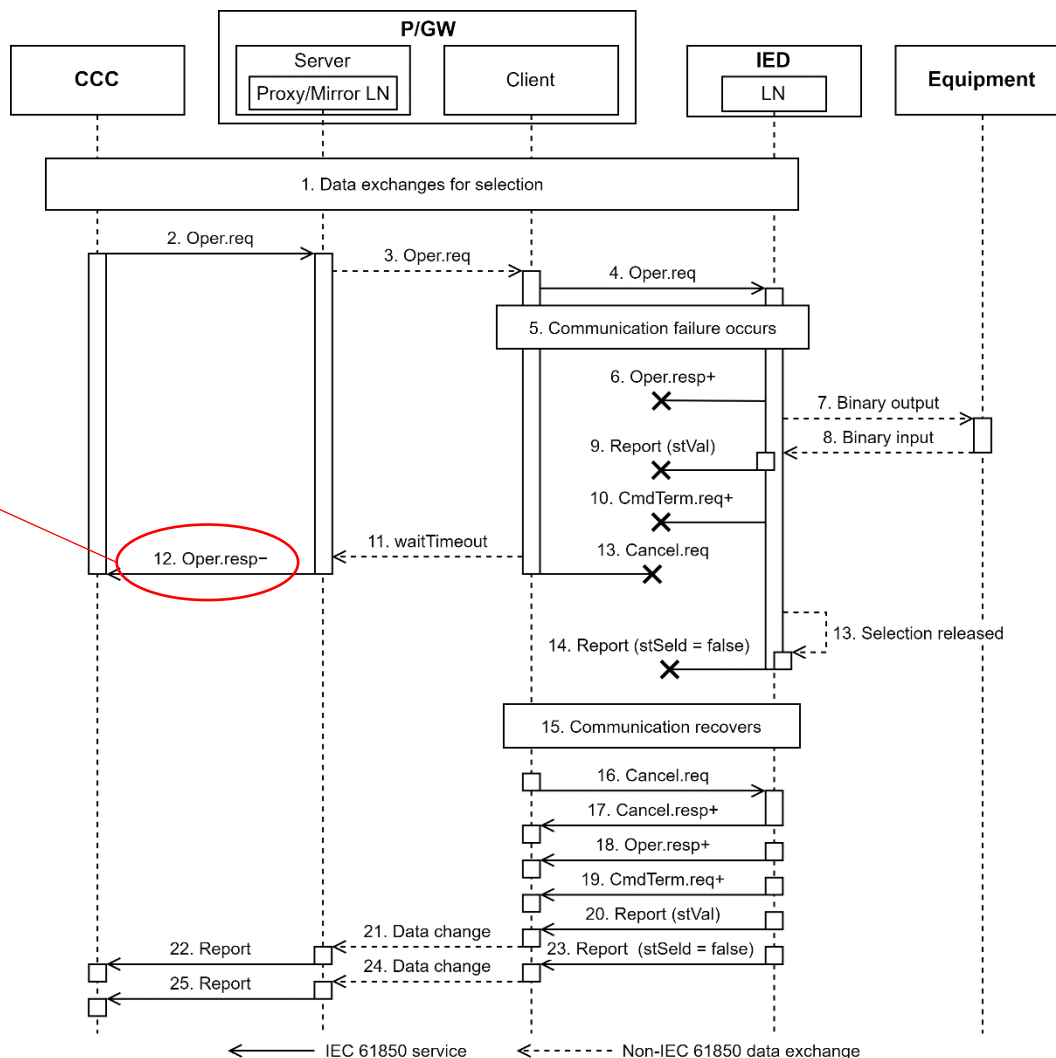
- Propose AddCause values.
 - In the end, the proposed values should be defined in a core part of IEC 61850.

Communication-timeout

Case 1: Wait timeout in WaitForSelVal_reqAck

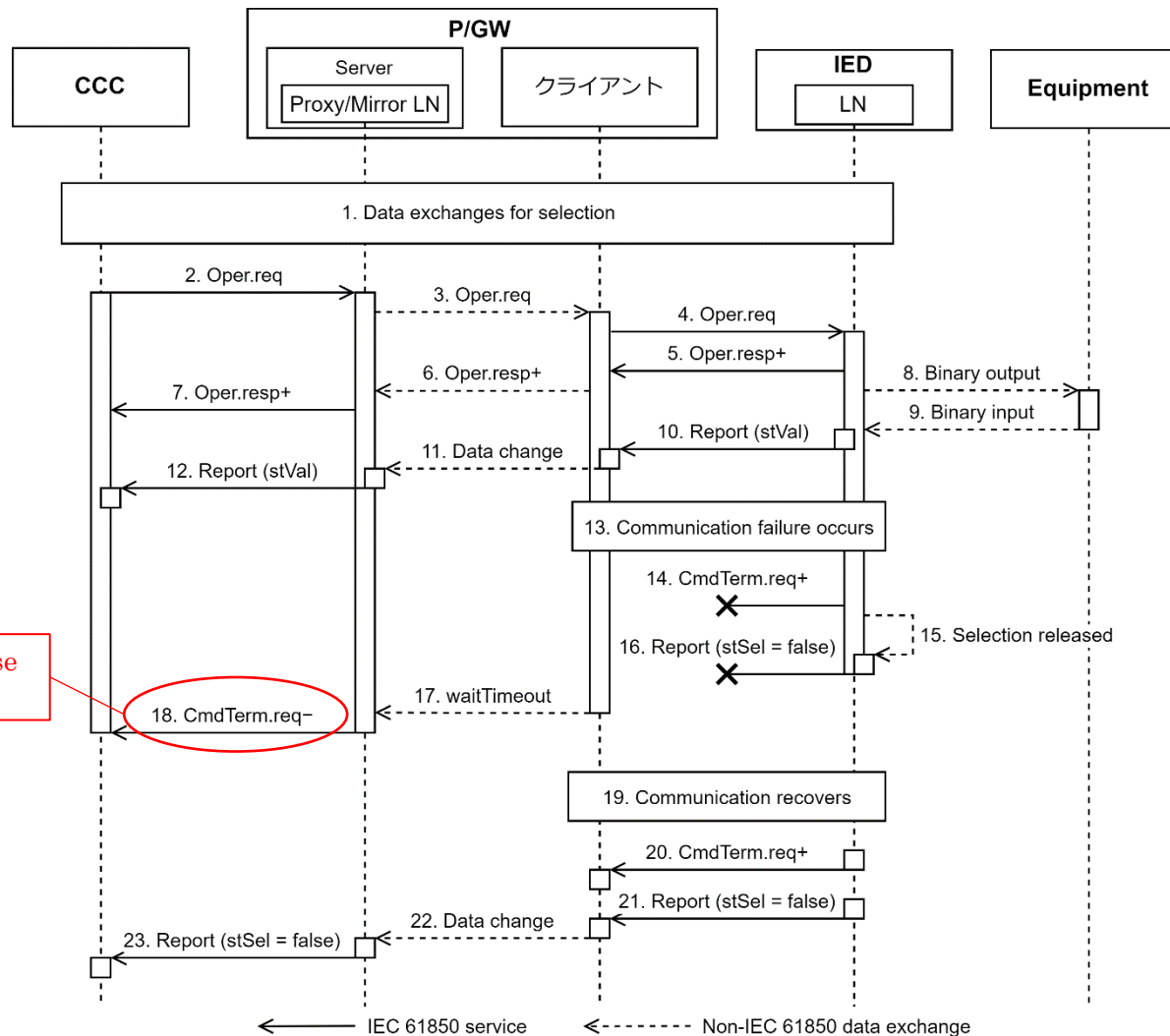


Case 2: Wait timeout in WaitForOper_reqAck

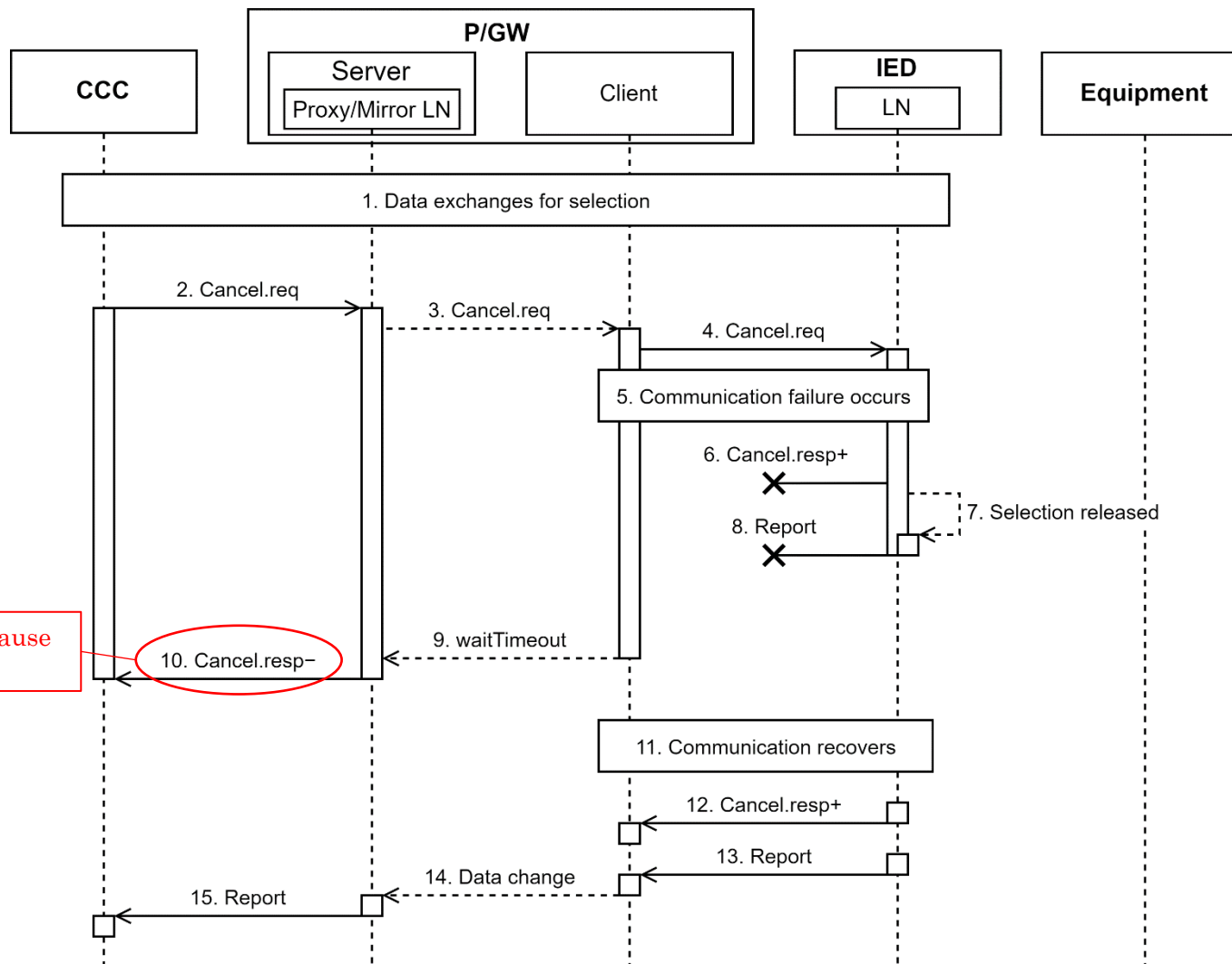


Appropriate AddCause value is missing.

Case 3: Wait timeout in WaitForCmdTerm



Case 4: Wait timeout in WaitForClientCancel_reqAck



AddCause values defined in Part 7-2

Table 21 – Literals of ControlServiceStatusKind

ControlServiceStatusKind		
enumeration item	value	description
Unknown	0	Command not successful due to unknown causes.
Not-supported	1	Control action is not supported (for example, a usually controllable object is not controllable, such as when 'XCBR.Pos.ctlModel'='status-only').
Blocked-by-switching-hierarchy	2	Failure since one of the downstream local status (e.g. Loc, LocSta) like in CSWI/XCBR has the value true.
Select-failed	3	Cancelled due to an unsuccessful selection ('select' service).
Invalid-position	4	Control action is aborted due to, for example, invalid switch position ('XCBR.Pos' or 'XSWI.Pos').
Position-reached	5	Equipment is already in the intended position (e.g., 'XCBR.Pos' or 'XSWI.Pos').
Parameter-change-in-execution	6	Control action is blocked due to running parameter change.
Step-limit	7	Control action is blocked because an end position of raise/lower command has been reached (e.g., EndPosR or EndPosL in YLTC, ATCC or YEFN).

AddCause values defined in Part 7-2

Blocked-by-Mode	8	Control action is blocked because the LN (e.g., CSWI or XCBR/XSWI) is in a mode (Beh) that doesn't allow any switching.
Blocked-by-process	9	Control action is blocked due to some external event at process level that prevents a successful operation, for example, blocking indication (EEHealth in XCBR or XSWI).
Blocked-by-interlocking	10	Control action is blocked due to interlocking of switching devices ('CILO.EnaOpn.stVal'=false or 'CILO.EnaCls.stVal'=false).
Blocked-by-synchrocheck	11	Control action with synchrocheck is aborted due to exceed of time limit and missing synchronism condition.
Command-already-in-execution	12	'control', 'select' or 'cancel' service is rejected, because control action is already running.
Blocked-by-health	13	Control action is blocked due to some internal event that prevents a successful operation (Health).
1-of-n-control	14	Control action is blocked because another control action in a domain (for example substation) is already running (in any XCBR or XSWI of that domain, 'DPC.stSeld'=true).
Abortion-by-cancel	15	Control action is aborted due to 'cancel' service.

AddCause values defined in Part 7-2

ControlServiceStatusKind		
enumeration item	value	description
Time-limit-over	16	Control action is terminated due to exceed of some time limit.
Abortion-by-trip	17	Control action is aborted due to a trip ('PTRC.Op.general'=true or 'PTRC.Tr.general'=true).
Object-not-selected	18	Control action is rejected, because control object was not selected.
Object-already-selected	19	Select action is not executed, because the addressed object is already selected.
No-access-authority	20	Control action is blocked due to lack of access authority.
Ended-with-overshoot	21	Control action executed but the end position has overshoot.
Abortion-due-to-deviation	22	Control action is aborted due to deviation between the command value and the measured value.
Abortion-by-communication-loss	23	Control action is aborted due to the loss of connection with the client that issued the control.
Blocked-by-command	24	Control action is blocked due to explicit block command ('CmdBlk.stVal'=true).
None	25	Control action successfully executed.
Inconsistent-parameters	26	The parameters between successive control services are not consistent, for example the 'ctlNum' of 'selectWithValue' and 'operate' service are different, or the service parameters use values out-of-range of the supported range.
Locked-by-other-client	27	Another client has already reserved the object.

This value is inappropriate from the following reasons:

- Cases with no-response from IED do not always include forced termination of control action such as P. 4-7.
- This value is used in the case that IED sends CmdTerm.resp- due to non-performance of equipment. Such case and the case with no-response from IED should be discriminable.

This value is inappropriate from the following reasons:

- Cases with no-response from IED do not always include abortion of control action such as P. 4-7.
- This value is used in the case that loss of connection with a client that issued control request is happening. Here, such client is CCC.

Proposition

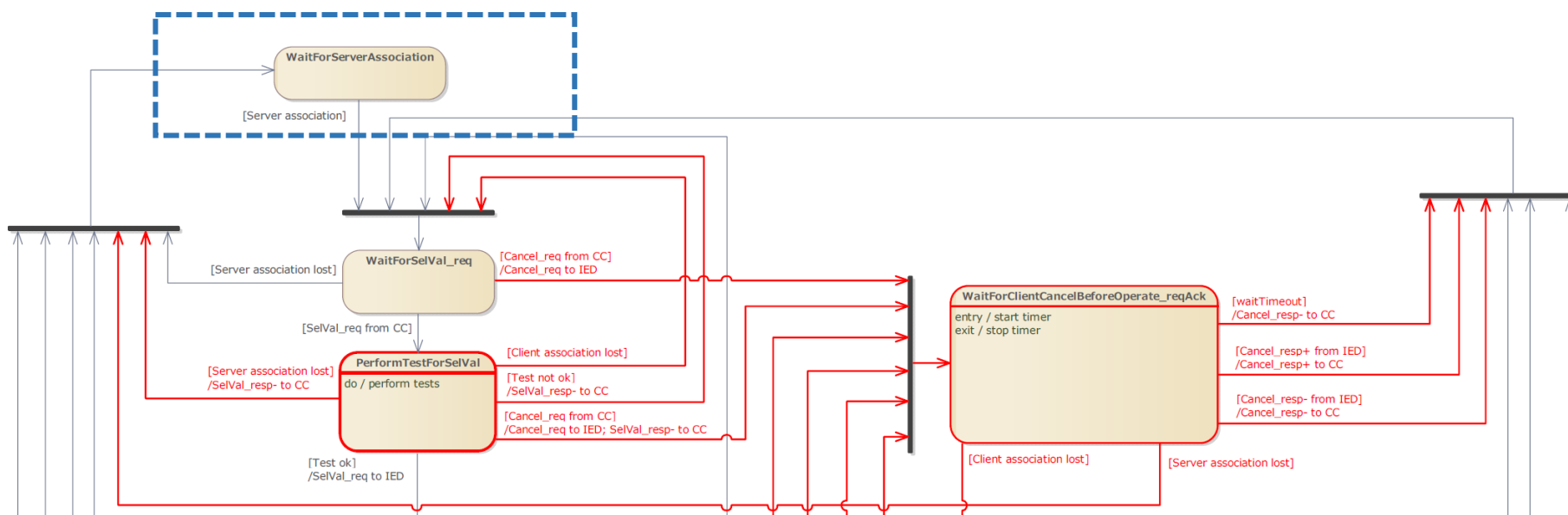
- ◆ Define new AddCause value
 - Item: Communication-timeout
 - Value: 28

Communication-lost

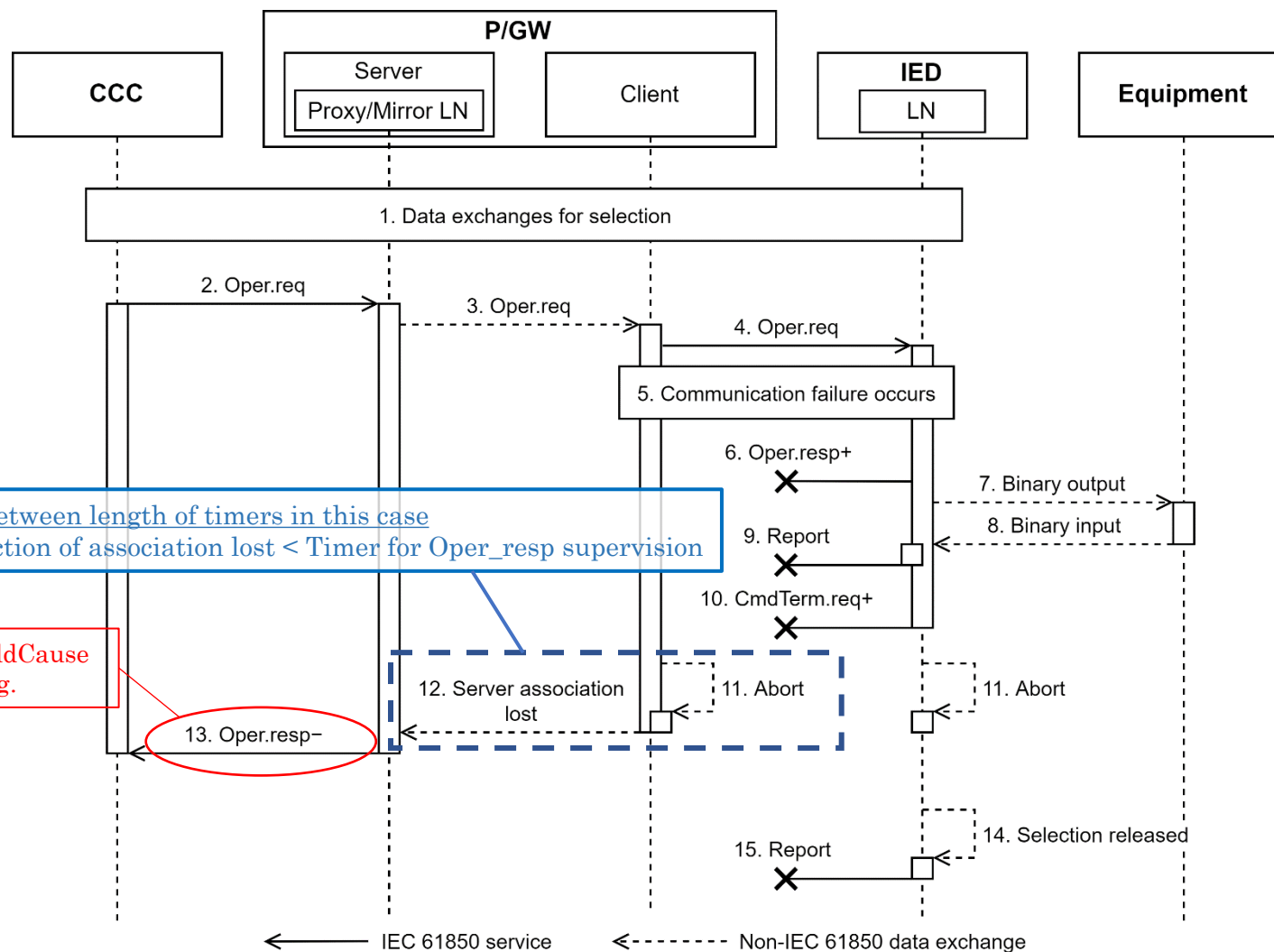
Case 1: Control request during association lost

◆ Case description

- During association lost between P/GW and IED, P/GW stays in WaitForServerAssociation.
- Here, P/GW sends response– for control request from CCC.



Case 2: Association lost in WaitForOper_reqAck



Relationship between length of timers in this case
 Timer for detection of association lost < Timer for Oper_resp supervision

Appropriate AddCause value is missing.

Proposition

- ◆ Define new AddCause value
 - Item: Communication-lost
 - Value: 29