

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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DELAY AND POWER CALCULATION STANDARDS –

Part 4: Design and Verification of Low-Power, Energy-Aware Electronic Systems

CORRIGENDUM 1

9.7.3 Retention modeling for different retention styles

Replace Table 10 with the following table:

| VDD | VDD<br>RET | SS<br>&&<br>SC | RS<br>&&<br>RC | RTC   | Retained<br>value      | Register<br>value          | Register state      | Valid next<br>states              | Comments                     |
|-----|------------|----------------|----------------|-------|------------------------|----------------------------|---------------------|-----------------------------------|------------------------------|
| ON  | ON         | FALSE          | FALSE          | FALSE | Previous<br>saved data | Previous<br>state<br>value | NORMAL              | SAVE,<br>RESTORE                  | —                            |
| ON  | ON         | FALSE          | FALSE          | TRUE  | Previous<br>saved data | Previous<br>state<br>value | RETAIN_ON           | NORMAL,<br>RETAIN_OFF,<br>RESTORE | —                            |
| ON  | ON         | FALSE          | TRUE           | X     | Previous<br>saved data | Retention<br>value         | RESTORE             | NORMAL,<br>RETAIN_ON              | —                            |
| ON  | ON         | TRUE           | FALSE          | X     | Register<br>value      | Previous<br>state<br>value | SAVE                | RETAIN_ON,<br>NORMAL              | —                            |
| ON  | ON         | TRUE           | TRUE           | X     | CORRUPT                | CORRUPT                    | CORRUPT             | NA                                | SAV_RES_COR<br>is set        |
| ON  | OFF        | X              | X              | TRUE  | CORRUPT                | CORRUPT                    | CORRUPT             | NA                                | —                            |
| ON  | OFF        | X              | TRUE           | FALSE | CORRUPT                | CORRUPT                    | CORRUPT             | NA                                | RET_SUP_COR<br>is set        |
| ON  | OFF        | X              | FALSE          | FALSE | CORRUPT                | Previous<br>state<br>value | PARTIAL_<br>CORRUPT | NORMAL                            | RET_SUP_COR<br>is set        |
| OFF | OFF        | X              | X              | X     | CORRUPT                | CORRUPT                    | CORRUPT             | NA                                | RET_SUP_COR<br>is set        |
| OFF | ON         | FALSE          | FALSE          | FALSE | CORRUPT                | CORRUPT                    | CORRUPT             | NA                                | !RTC                         |
| OFF | ON         | FALSE          | FALSE          | TRUE  | Previous<br>saved data | CORRUPT                    | RETAIN_OFF          | RETAIN_ON                         | —                            |
| OFF | ON         | FALSE          | TRUE           | X     | CORRUPT                | CORRUPT                    | CORRUPT             | NA                                | Restore during<br>power-down |
| OFF | ON         | TRUE           | X              | X     | CORRUPT                | CORRUPT                    | CORRUPT             | NA                                | Save during<br>power-down    |

\*The X in this table denotes a "don't care" condition. Valid next states are non-corrupting next states.

### 10.6.1.1 Power domain

Replace the table with the following table:

|                                                            |                                                                        |                                                                                                                                                                  |
|------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Class name</b>                                          | upfPowerDomainT                                                        |                                                                                                                                                                  |
| <b>Class membership</b>                                    | upfPowerDomainT, upfExtentClassT, upfBaseUpfT, upfBaseNamedT, upfBaseT |                                                                                                                                                                  |
| <b>Handle ID</b>                                           | <handle ID of upf_parent>/<upf_name of Object>                         |                                                                                                                                                                  |
| <b>Handle ID examples</b>                                  | /top/dut_i/PD                                                          |                                                                                                                                                                  |
| <b>Property</b>                                            | <b>Return value</b>                                                    | <b>Description</b>                                                                                                                                               |
| upf_name                                                   | upfStringT                                                             | Name of object                                                                                                                                                   |
| upf_parent                                                 | upfBaseNamedT                                                          | Parent of object                                                                                                                                                 |
| upf_file                                                   | upfStringT                                                             | Filename where object was created                                                                                                                                |
| upf_line                                                   | upfIntegerT                                                            | Line number where object was created                                                                                                                             |
| upf_creation_scope                                         | upfHdlScopeT                                                           | The HDL scope in which the object was created                                                                                                                    |
| upf_effective_extents                                      | upfExtentT                                                             | The upfExtentT object that points to the first element in the resolved element_list of corresponding UPF command (see <a href="#">10.6.3.1</a> for more details) |
| upf_supply_set_handles                                     | List of upfSupplySetT                                                  | The list of supply set handles defined on the object                                                                                                             |
| upf_upper_boundary                                         | List of upfHdlScopeT                                                   | The list of HDL scopes forming the upper boundary of this power domain                                                                                           |
| upf_lower_boundary                                         | List of upfBaseHdlT                                                    | The list of HDL objects forming the lower boundary of this power domain                                                                                          |
| upf_level_shifter_strategies                               | List of upfLevelShifterStrategyT                                       | The list of level-shifter strategies defined for this power domain                                                                                               |
| upf_retention_strategies                                   | List of upfRetentionStrategyT                                          | The list of retention strategies defined for this power domain                                                                                                   |
| upf_isolation_strategies                                   | List of upfIsolationStrategyT                                          | The list of isolation strategies defined for the power domain                                                                                                    |
| upf_repeater_strategies                                    | List of upfRepeaterStrategyT                                           | The list of repeater strategies defined for the power domain                                                                                                     |
| upf_pd_states                                              | List of upfPowerStateT                                                 | List of states defined on power domain                                                                                                                           |
| upf_pd_state_transitions                                   | List of upfPowerStateTransitionT                                       | List of power state transitions defined by add_state_transition command                                                                                          |
| upf_available_supplies                                     | List of upfSupplySetT                                                  | List of supply sets that are present in effective_available_supply_list (see <a href="#">6.20</a> )                                                              |
| upf_boundary_supplies                                      | List of upfSupplySetT                                                  | List of supply sets that are present in effective_boundary_supply_list (see <a href="#">6.20</a> )                                                               |
| <b>Dynamic property (only available during simulation)</b> |                                                                        |                                                                                                                                                                  |
| upf_current_state                                          | upfPowerStateT                                                         | The current state of the object during simulation                                                                                                                |
| upf_current_simstate                                       | upfSimstateE                                                           | The current simstate of primary supply set of the power domain                                                                                                   |

### 11.2.2.6 Property ID

Replace Table 40 with the following table:

| upfPropertyIdE |                                 |                         |                                  |                                 |
|----------------|---------------------------------|-------------------------|----------------------------------|---------------------------------|
| S. no.         | Property name                   | Base class hierarchy    | Return type                      | Property ID                     |
| 1              | upf_parent                      | upfBaseNamedT           | upfBaseNamedT                    | UPF_PARENT                      |
| 2              | upf_name                        | upfBaseNamedT           | upfStringT                       | UPF_NAME                        |
| 3              | upf_hdl_attributes              | upfBaseHdlT, upfDesignT | List of upfAttributeT            | UPF_HDL_ATTRIBUTES              |
| 4              | upf_extents                     | upfBaseHdlT             | List of upfExtentT               | UPF_EXTENTS                     |
| 5              | upf_cell_info                   | upfBaseHdlT             | upfCellT                         | UPF_CELL_INFO                   |
| 6              | upf_creation_scope              | upfBaseUpfT             | upfBaseHdlT                      | UPF_CREATION_SCOPE              |
| 7              | upf_line                        | upfBaseUpfT             | upfIntegerT                      | UPF_LINE                        |
| 8              | upf_file                        | upfBaseUpfT             | upfStringT                       | UPF_FILE                        |
| 9              | upf_effective_extents           | upfExtentClassT         | upfExtentT                       | UPF_EFFECTIVE_EXTENTS           |
| 10             | upf_supply_set_handles          | upfExtentClassT         | List of upfSupplySetT            | UPF_SUPPLY_SET_HANDLES          |
| 11             | upf_lower_boundary              | upfPowerDomainT         | List of upfBaseHdlT              | UPF_LOWER_BOUNDARY              |
| 12             | upf_isolation_strategies        | upfPowerDomainT         | List of upfIsolationStrategyT    | UPF_ISOLATION_STRATEGIES        |
| 13             | upf_level_shifter_strategies    | upfPowerDomainT         | List of upfLevelShifterStrategyT | UPF_LEVEL_SHIFTER_STRATEGIES    |
| 14             | upf_pd_states                   | upfPowerDomainT         | List of upfPowerStateT           | UPF_PD_STATES                   |
| 15             | upf_pd_state_transitions        | upfPowerDomainT         | List of upfPowerStateTransitionT | UPF_PD_STATE_TRANSITIONS        |
| 16             | upf_subdomains                  | upfCompositeDomainT     | List of upfBaseUpfT              | UPF_SUBDOMAINS                  |
| 17             | upf_repeater_strategies         | upfPowerDomainT         | List of upfRepeaterStrategyT     | UPF_REPEATER_STRATEGIES         |
| 18             | upf_retention_strategies        | upfPowerDomainT         | List of upfRetentionStrategyT    | UPF_RETENTION_STRATEGIES        |
| 19             | upf_current_state               | upfPowerDomainT         | upfPowerStateT                   | UPF_CURRENT_STATE               |
| 20             | upf_functions                   | upfSupplySetT           | List of upfNamedRefT             | UPF_FUNCTIONS                   |
| 21             | upf_ss_states                   | upfSupplySetT           | List of upfPowerStateT           | UPF_SS_STATES                   |
| 22             | upf_ss_transitions              | upfSupplySetT           | List of upfPowerStateTransitionT | UPF_SS_TRANSITIONS              |
| 23             | upf_equivalent_sets             | upfSupplySetT           | List of upfSupplySetT            | UPF_EQUIVALENT_SETS             |
| 24             | upf_logic_refs                  | upfStrategyT            | List of upfNamedRefT             | UPF_LOGIC_REFS                  |
| 25             | upf_is_no_retention             | upfRetentionStrategyT   | upfBooleanT                      | UPF_IS_NO_RETENTION             |
| 26             | upf_is_use_retention_as_primary | upfRetentionStrategyT   | upfBooleanT                      | UPF_IS_USE_RETENTION_AS_PRIMARY |