**Changes resulting from the Agencies Review updates**

**Services & Operations**

1. PRS:monitorRequestStatus(): “status” key data type from “MAL::UInteger” to “MAL::UShort” (DLR-049)
2. PRS:monitorRequestStatus(): error “INVALID” removed (ESA-018)
3. PDS:monitorPlanStatus(): “status” key data type from “MAL::UInteger” to “MAL::UShort” (DLR-049)
4. PDS:monitorPlanStatus(): error “INVALID” removed (ESA-018)
5. PDS:monitorPlan(): “status” key data type from “MAL::UInteger” to “MAL::UShort” (DLR-049)
6. PDS:monitorPlan(): error “INVALID” removed (ESA-018)
7. PECS:submitPlan(): error “SUBMIT\_FAILED” added (ESA-092)
8. PECS:deactivatePlan(): “deactivationMode” key data type from “MAL::String” to “MAL::Identifier” (CNES-042)
9. PECS: deactivatePlan(): error “DEACTIVATE\_FAILED” added (ESA-092)
10. PECS:monitorPlanExecution(): “status” key data type from “MAL::UInteger” to “MAL::UShort” (DLR-049)
11. PECS:monitorPlanExecution(): error “INVALID” removed (ESA-018)
12. PECS:monitorPlanExecutionDetail(): “tags” key name changed to “tag” (DLR-057)
13. PECS:monitorPlanExecutionDetail(): error “INVALID” removed (ESA-018)
14. PECS:monitorSubPlanExecution(): error “INVALID” removed (ESA-018)
15. PECS:suspendActivity(): “planRefs” key Nullable from “No” to “Yes” (DLR-060)
16. PECS:resumeActivity(): “planRefs” key Nullable from “No” to “Yes” (DLR-060)
17. PECS:getActivityStatys(): “planRefs” key Nullable from “No” to “Yes” (DLR-060)
18. PIMS:getSystemConfig(): operation removed (CNES-043)
19. PES:updateResource(): operation renamed to “updateResourceValue” (DLR-014)

**Composites**

1. ActivityDefinition: field “constraints” type changed from “ConstraintNode” to “Constraint” (ESA-050)
2. ActivityDefinition: field “effects” added (type: List<Effect>) (ESA-050)
3. ActivityDefinition: field “children” type changed from “activityNode” to “List<ActivityDetails>” (ESA-050)
4. ActivityInstance: field “source” type changed from “MAL::ObjectRef” to “MAL::ObjectRef<MAL::Element>” (DLR-039)
5. ActivityInstance: field “constraints” type changed from “ConstraintNode” to “Constraint” (ESA-050)
6. ActivityInstance: field “effects” added (type: List<Effect>) (ESA-050)
7. RequestDefinition: field “constraints” removed (ESA-085)
8. RequestDefinition: field “activities” type changed from “activityNode” to “List<ActivityDetails>” (ESA-050)
9. RequestInstance: field “requestDetails” of type “PlanningRequestDetails” added, fields “userReference” and all fields from “definition” until “comments” removed (DLR-082)
10. RequestInstance: field “creationDate” change to “creationTime” (ESA-033)
11. Plan: field “revisions” type changed from “PlanRevisions” to “List<PlanRevision>” (ESA-035)
12. Plan: field “resources” type changed from “PlanResources” to “List<ResourceProfile>” (ESA-035)
13. MPSSystemConfigDetails: data type **removed** (CNES-043)
14. SimpleActivityDetails: field “constraints” type changed from “ConstraintNode” to “Constraint” (ESA-050)
15. SimpleActivityDetails: field “effects” added (type: List<Effect>) (ESA-050)
16. InsertedActivityDetails: field “constraints” type changed from “ConstraintNode” to “Constraint” (ESA-050)
17. InsertedActivityDetails: field “effects” added (type: List<Effect>) (ESA-050)
18. ProfileSegment: field “interpolation” Nullable property changed from “False” to “True” (DLR-079)
19. ProfileSegment: field “startIncluded” Nullable property changed from “False” to “True” (DLR-079)
20. ProfileSegment: field “endIncluded” Nullable property changed from “False” to “True” (DLR-079)
21. RelativeProfileSegment: field “interpolation” Nullable property changed from “False” to “True” (DLR-079)
22. RelativeProfileSegment: field “startIncluded” Nullable property changed from “False” to “True” (DLR-079)
23. RelativeProfileSegment: field “endIncluded” Nullable property changed from “False” to “True” (DLR-079)
24. RequestStatusUpdate: field “outputPlanRef” type changed from “MAL::ObjectRef<Plan>” to “List< MAL::ObjectRef<Plan>>” (ESA-041)  
    [field “outputPlanRef” name changed to “outputPlanRef**s**” (MPS-005)]
25. PlanningRequestDetails: field “timeSystem” type changed from “MAL::String” to “MAL::Identifier” (DLR-067)
26. PlanningRequestDetails: field “constraints” removed (ESA-085)
27. PlanningRequestDetails: field “activities” type changed from “activityNode” to “List<ActivityDetails>” (ESA-050)
28. RequestSummaryStatus: field “creationDate” renamed to “creationTime” (ESA-033)
29. RequestSummaryStatus: field “validityTime” renamed to “validityTime**s**” (DLR-083)
30. RequestSummaryStatus: field “validityEvent” renamed to “validityEvent**s**” (DLR-083)
31. RequestFilter: field “creationDate” change to “creationTime” (ESA-033)
32. RequestFilter: field “outputPlanRef” type changed from “MAL::ObjectRef<Plan>” to “List< MAL::ObjectRef<Plan>>” (ESA-041)  
    [field “outputPlanRef” name changed to “outputPlanRef**s**” (MPS-005)]
33. PlanInformation: field “productionDate” change to “productionTime” (ESA-033)
34. PlanInformation: field “timeSystem” type changed from “MAL::String” to “MAL::Identifier” (DLR-067)
35. PlanRevisions: data type **removed** (ESA-035)
36. ItemRevision: field “itemRef” type changed from “MAL::ObjectRef” to “MAL::ObjectRef<MAL::Element>” (DLR-039)
37. PlanResources: data type **removed** (ESA-035)
38. PlanQuery: field “productionDate” change to “productionTime” (ESA-033)
39. PlanQuery: field “containedEvents” split into field “plannedEvents” and “revisedEvents” (DLR-010)
40. PlanQuery: field “containedActivities” split into field “plannedActivities” and “revisedActivities” (DLR-010)
41. NamedElement: data type **added** (NASA-025)
42. CartesianPosition: field “frame” type changed from “MAL::String” to “MAL::Identifier” (DLR-067)
43. SurfacePosition: field “frame” type changed from “MAL::String” to “MAL::Identifier” (DLR-067)
44. OrbitFilePosition: field “orbitFile” type changed from “MAL::String” to “MAL::File” (DLR-067) [PP: there is no reference in our book to this MAL type (note that this will also impact the File Formats XSDs, to define this MAL type) (MPS-006)]
45. CartesianDirection: field “frame” type changed from “MAL::String” to “MAL::Identifier” (DLR-067)
46. SphericalDirection: field “frame” type changed from “MAL::String” to “MAL::Identifier” (DLR-067)
47. RADecDirection: field “frame” type changed from “MAL::String” to “MAL::Identifier” (DLR-067)
48. RevolutionDirection: data type **removed** (ESA-049)
49. Expression: data type **removed** (ESA-064)
50. EventWindow: field “startOffset” Nullable property changed from “False” to “True” (ESA-055)
51. EventWindow: field “endOffset” Nullable property changed from “False” to “True” (ESA-055)
52. DefListEntry: field “definitionID” type changed from “MAL::ObjectRef” to “MAL::ObjectRef<MAL::Element>” (DLR-039)
53. ExternalExpression: data type **added** (ESA-059)
54. ArgDef: field “argUnits” changed name to “argUnit” (DLR-088) [PP: “units” (plural form) is consistently used in this book (from “units of measure”), if changed here then it should be changed everywhere (MPS-008)]
55. Argument: field “count” removed (DLR-089)
56. Argument: field “argValues” type changed from “MAL::Attribute” to “MAL::Element” (NASA-025)
57. ArgSpec: field “count” removed (DLR-089)
58. NumericRange: field “min” Nullable property changed from “False” to “True” (DLR-093)
59. NumericRange: field “max” Nullable property changed from “False” to “True” (DLR-093)
60. NumericRange: field “precision” removed (DLR-091)
61. StringPattern: field “maxLength” Nullable property changed from “False” to “True” (DLR-093)
62. StringPattern: field “regex” Nullable property changed from “False” to “True” (DLR-093)
63. Constraint: field “negate” added (type: MAL::Boolean) (ESA-050)
64. ConstraintNode: field “operator” Nullable property changed from “False” to “True” (ESA-050)
65. ConstraintNode: field “negate” removed (ESA-050)
66. ConditionalConstraint: data type **removed** (ESA-050)
67. ConstraintExpression: “extends” property changed from “ConditionalConstraint” to “Constraint” (ESA-050)
68. TemporalConstraint: “extends” property changed from “ConditionalConstraint” to “Constraint” (ESA-050)
69. TemporalConstraint: field “activityRef” removed (ESA-083) [PP: currently, TemporalConstraint is not providing any functionality (no fields anymore) and will be removed (MPS-009)]
70. TimeWindowConstraint: field “startRef” Nullable property changed from “False” to “True” (ESA-055)
71. TimeWindowConstraint: field “endRef” Nullable property changed from “False” to “True” (ESA-055)
72. DurationConstraint: field “minDuration” Nullable property changed from “False” to “True” (ESA-051)
73. DurationConstraint: field “maxDuration” Nullable property changed from “False” to “True” (ESA-052)
74. SequentialConstraint: “extends” property changed from “ConditionalConstraint” to “Constraint” (ESA-050)
75. SequentialConstraint: field “predecessor” changed to “opponent” (NASA-008)
76. SequentialConstraint: field “successor” removed (NASA-008)
77. SequentialConstraint: field “predecessorRef” change to “parentRef” (NASA-008)
78. SequentialConstraint: field “successorRef” change to “opponentRef” (NASA-008)
79. SequentialConstraint: field “minOffset” Nullable property changed from “False” to “True” (ESA-052)
80. SequentialConstraint: field “maxOffset” Nullable property changed from “False” to “True” (ESA-052)
81. SeparationConstraint: data type **renamed** from “ExclusionConstraint” to “SeparationConstraint” (NASA-008)
82. SeparationConstraint: “extends” property changed from “ConditionalConstraint” to “Constraint” (ESA-050)
83. SeparationConstraint: field “classRefs” renamed to “opponent”, List property removed, type changed from “MAL::ObjectRef” to “MAL::ObjectRef< MAL::Element >” (NASA-008, DLR-039)
84. SeparationConstraint: field “startRef” added (type: Slider) [NASA-008]
85. SeparationConstraint: field “startOffset” added (type: Expression) [NASA-008]
86. SeparationConstraint: field “endRef” added (type: Slider) [NASA-008]
87. SeparationConstraint: field “endOffset” added (type: Expression) [NASA-008]
88. SeparationConstraint: field “opponentStartRef” added (type: Slider) [NASA-008]
89. SeparationConstraint: field “opponentStartOffset” added (type: Expression) [NASA-008]
90. SeparationConstraint: field “opponentEndRef” added (type: Slider) [NASA-008]
91. SeparationConstraint: field “opponentEndOffset” added (type: Expression) [NASA-008]
92. ArgumentConstraint: “extends” property changed from “ConditionalConstraint” to “Constraint” (ESA-050)
93. ArgumentConstraint: field “activityRef” removed (ESA-083)
94. ArgumentConstraint: field “value” type changed from “MAL::Attribute” to “MAL::Element” (DLR-090)
95. ResourceConstraint: “extends” property changed from “ConditionalConstraint” to “Constraint” (ESA-050)
96. ResourceConstraint: field “activityRef” removed (ESA-083)
97. ResourceConstraint: field “value” type changed from “MAL::ObjectRef” to “MAL::ObjectRef<Resource>” (DLR-097)
98. ComplexResourceConstraint: field “startRef” Nullable property changed from “False” to “True” (ESA-055)
99. ComplexResourceConstraint: field “endRef” Nullable property changed from “False” to “True” (ESA-055)
100. ComplexResourceConstraint: field “startOffset” Nullable property changed from “False” to “True” (ESA-055)
101. ComplexResourceConstraint: field “endOffset” Nullable property changed from “False” to “True” (ESA-055)
102. FunctionConstraint: “extends” property changed from “ConditionalConstraint” to “Constraint” (ESA-050)
103. FunctionConstraint: field “activityRef” removed (ESA-083)
104. FunctionConstraint: field “startRef” Nullable property changed from “False” to “True” (ESA-055)
105. FunctionConstraint: field “endRef” Nullable property changed from “False” to “True” (ESA-055)
106. FunctionConstraint: field “startOffset” Nullable property changed from “False” to “True” (ESA-055)
107. FunctionConstraint: field “endOffset” Nullable property changed from “False” to “True” (ESA-055)
108. GeometricConstraint: “extends” property changed from “ConditionalConstraint” to “Constraint” (ESA-050)
109. GeometricConstraint: field “activityRef” removed (ESA-083)
110. GeometricConstraint: field “startRef” Nullable property changed from “False” to “True” (ESA-055)
111. GeometricConstraint: field “endRef” Nullable property changed from “False” to “True” (ESA-055)
112. GeometricConstraint: field “startOffset” Nullable property changed from “False” to “True” (ESA-055)
113. GeometricConstraint: field “endOffset” Nullable property changed from “False” to “True” (ESA-055)
114. EllipsoidalPositionConstraint: data type **added** (DLR-006)
115. PointingConstraint: field “pointingFrame” type changed from “MAL::String” to “MAL::ObjectRef<MAL::Identifier>” (DLR-067)
116. PointingConstraint: field “pointingArguments” type changed from “MAL::NamedValue” to “MAL::ObjectRef<NamedElement>” (NASA-025)
117. Effect: “extends” property changed from “Constraint” to “MAL::Composite” (NASA-008)
118. Effect: field “activityRef” removed (ESA-083)
119. Effect: field “pointingFrame” type changed from “MAL::ObjectRef” to “MAL::ObjectRef<Resource>” (DLR-039)
120. SimpleEffect: field “timeOffset” Nullable property changed from “False” to “True” (ESA-055)
121. ComplexEffect: field “startRef” Nullable property changed from “False” to “True” (ESA-055)
122. ComplexEffect: field “endRef” Nullable property changed from “False” to “True” (ESA-055)
123. ComplexEffect: field “startOffset” Nullable property changed from “False” to “True” (ESA-055)
124. ComplexEffect: field “endOffset” Nullable property changed from “False” to “True” (ESA-055)
125. ComplexEffect: “**V**alue” field name changed to “value” (ESA-094)
126. AngleTrigger: field “centreObject” type changed from “Expression<Position>” to “Position” (ESA-080)
127. AngleTrigger: field “targetObject1” type changed from “Expression<Position>” to “Position” (ESA-080)
128. AngleTrigger: field “targetObject2” type changed from “Expression<Position>” to “Position” (ESA-080)
129. AngleTrigger: field “angleMargin” removed (ESA-037)
130. AngleTrigger: field “minAngle” added (type: Angle) (ESA-037)
131. AngleTrigger: field “maxAngle” added (type: Angle) (ESA-037)

**Enumerations**

1. ArgTypeEnum: item “ANY” (20) inserted (NASA-025)
2. EffectOperationEnum: item “INCREMENT” renamed to “INCREASE” (NASA-021)
3. EffectOperationEnum: item “DECREMENT” renamed to “DECREASE” (NASA-021)

**Errors**

1. Errors: generic: start counting from 1 instead of 0 (DLR-009)
2. Errors: item “DEACTIVATE\_FAILED” (8) inserted (ESA-092)
3. Errors: item “SUBMIT\_FAILED” (9) inserted (ESA-092)
4. Errors: items 7/8/9 renumbered to 10/11/12 (DLR-009, ESA-092)