

MOSAIQ 2.20 RTP*CONNECT*

CONFORMANCE STATEMENT

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1. INTRODUCTION

1.1 PURPOSE

This document specifies the conformance of the IMPAC RTPConnect product, available in MOSAIQ 2.20, with the IMPAC RTPConnect Radiotherapy Treatment Planning Import/Export Interface Specification. The intended audience for this Conformance Statement is the Radiotherapy Treatment Planning (RTP) vendor and end-user. This Conformance Statement, in combination with the Conformance Statement from an RTP vendor, should help reduce the number of iterations needed for a successful import into the MOSAIQ management system.

1.2 SCOPE

RTPConnect is integrated with MOSAIQ 2.20 and available to customers as an optional product. RTPConnect is used to import/export data to/from MOSAIQ using the IMPAC RTPConnect Radiotherapy Treatment Planning Import/Export Interface.

1.3 REFERENCES

This document references the following documents:

DID	TITLE
LED17001	RTPConnect Radiotherapy Treatment Planning Import/Export Interface Specification, ©2009 IMPAC Medical Systems, Inc.

1.4 WHAT'S CHANGED?

1.4.1 Differences Between RTPCONNECT in MOSAIQ 2.10 and MOSAIQ 2.20

- Added support for PDF_FIELD_DEF:Treatment_Type = PATH for Accuray plans.

1.5 DOCUMENTATION CONVENTIONS

The following conventions are used throughout this document:

- File names, file paths, databases, and database fields are printed in mixed-case Courier typeface.

1.6 DEFINITIONS, ACRONYMS AND ABBREVIATIONS

This section provides an alphabetical list of definitions, acronyms, and abbreviations.

IEC Refers to the IEC Standard 1217: Radiotherapy Equipment – Coordinates, Movements and Scales (CEI/IEC 1217: 1996).

MLC Multi-Leaf Collimator

RTP Radiotherapy Treatment Planning

1.7 ASSUMPTIONS & CONSTRAINTS

MOSAIQ 2.20 must be properly installed with RTPConnect enabled.

2. CONFORMANCE

On Import, for all records, the calculated CRC for each record must match the value in the CRC field of the record, or the Import process will be disabled.

Sections 2.1 – 2.11 below pertain to each RTP Import/Export record defined in LED17001. Each of these sections for supported records contains a table with one row per record data element defined in LED17001. For each data element, the indicator for "Supported" on "Import" entry is "Y" if the element can be imported by RTPConnect from the import file into MOSAIQ, or "N" if it cannot. Also for each data element, the indicator for "Supported" on "Export" entry is "Y" if the element is exported by RTPConnect from MOSAIQ to the export file, or "N" if it is not. The "Notes" entry contains details as necessary.

LED17001 must be referenced together with this document for a complete definition of the RTPConnect interface. Each data element shall conform to the format shown in the table in Section 4 of LED17001. Data of alphanumeric type shall be truncated if the specified maximum length is exceeded.

2.1 PLAN DEFINITION RECORD [PLAN_DEF]

Support for the Data Elements in the Plan Definition Record is indicated in the following table:

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
1. Keyword	Y	Y	"PLAN_DEF"
2. Patient_ID	Y	Y	On Export, the patient's primary ID. Import will proceed only if Patient_ID matches an existing patient. The Patient_ID (not Patient_Last_Name) is used to match the plan to an existing patient. If the Patient_Last_Name in the DB does not match the Last Name specified in the plan file, then a warning message displays regarding that import field. The patient's last name, first name and initial in the DB will not be modified based on the respective data in the plan file.
3. Patient_Last_Name	Y	Y	On Import, this item does not affect the existing value.
4. Patient_First_Name	N	Y	On Import, this item does not affect the existing value.
5. Patient_MInitial	N	Y	On Import, this item does not affect the existing value.
6. Plan_ID	N	N	
7. Plan_Date	N	N	
8. Plan_Time	N	N	
9. Course_ID	Y	Y	On Import, if Course_ID conflicts with (for example, equals) an existing course number, the import candidate course will be discarded and a warning message will display; otherwise, a new course will be created. On Export, exports the course number from the patient's last course. If no course is defined for the patient, then Course_ID = 0.
10. Diagnosis	N	Y	On Import, this item does not affect the existing value.
11. MD_Last_Name	Y	Y	On Import, if an MD with a matching name exists in the IMPAC DB, this MD is assigned to the patient. The name comparison is case insensitive.
12. MD_First_Name	Y	Y	See MD_Last_Name.
13. MD_MInitial	Y	Y	See MD_Last_Name.
14. MD_Approve_LName	N	N	
15. MD_Approve_FName	N	N	
16. MD_Approve_MInitial	N	N	
17. Phy_Approve_LName	N	N	
18. Phy_Approve_FName	N	N	
19. Phy_Approve_MInitial	N	N	
20. Author_Last_Name	N	N	
21. Author_First_Name	N	N	
22. Author_MInitial	N	N	
23. RTP_Mfg	Y	N	On Import, Machine Characterization conversion uses these data elements to find a matching source machine.
24. RTP_Model	Y	N	See RTP_Mfg.
25. RTP_Version	Y	N	See RTP_Mfg.
26. RTP_IF_Protocol	N	Y	On Export, "IMPAC-OpenRTP".
27. RTP_IF_Version	N	Y	On Export, this item will be set to the version of the MOSAIQ application
28. CRC	Y	Y	

2.2 PRESCRIPTION SITE RECORD [RX_DEF]

Support for the Data Elements in the Prescription Site Record is indicated in the following table:

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
1. Keyword	Y	Y	"RX_DEF"
2. Course_ID	Y	Y	On Import, if no course with this number exists or will be created as a result of this Import, an error message displays. On Export, one Prescription Site Record is generated for each Radiotherapy Prescription defined for the patient as part of the Course of therapy in the Plan Definition Record.
3. Rx_Site_Name	Y	Y	On Import, if Rx_Site_Name conflicts with an existing prescription (for example, the name is the same), the imported prescription will be discarded and a warning message will display; otherwise, a new prescription will be created.
4. Technique	Y	Y	
5. Modality	Y	Y	
6. Dose_Spec	Y	Y	
7. Rx_Depth	Y	Y	
8. Dose_TTL	Y	Y	On Import, values greater than 9999 and less than 32768 will be imported, but will cause a display overflow (for example, "####") in some windows. On Import, if Dose_TTL is either negative or greater than 32767, an error message will display and the Import process will be disabled. On Export, the data format is nnnn. Values greater than 9999 will be exported as "####".
9. Dose_Tx	Y	Y	On Import, if Dose_Tx is negative, an error message will display and the Import process will be disabled.
10. Pattern	Y	Y	
11. Rx_Note	Y	Y	
12. Number_of_Fields	Y	Y	
13. CRC	Y	Y	

2.3 SITE SETUP RECORD [SITE_SETUP_DEF]

Support for the Data Elements in the Site Setup Record is indicated in the following table:

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
1. Keyword	Y	Y	"SITE_SETUP_DEF"
2. Rx_Site_Name	Y	Y	On Import, set if and only if a match is detected with an already defined prescription site. If a match is not found for the specified Rx_Site_Name, a message to that effect will display and the Import process will be disabled
3. Patient_Orientation	Y	Y	On Import, if a match is not found, the import value will be set to NULL and a message to that effect will display.
4. Treatment_Machine	Y	Y	On Import, the Treatment_Machine field is used to find a matching treatment machine already defined in the database. <ul style="list-style-type: none"> If no match is found, a message to that effect will display and the Import process will be disabled.
5. Tolerance_Table	Y	Y	On Import, the Tolerance_Table field is used to find a matching Site Tolerance Table ID already defined in the database. If no match is found, a message to that effect will display and the Import process will be disabled.
6. Isocenter_Position_X	Y	Y	
7. Isocenter_Position_Y	Y	Y	
8. Isocenter_Position_Z	Y	Y	
9. Structure_Set_UID	Y	Y	
10. Frame_Of_Reference_UID	Y	Y	
11. Couch_Vertical	Y	Y	On Import: <ul style="list-style-type: none"> If Couch_Vertical is non-zero, the [Couch Vertical] section must be defined in the machine characterization record for the treatment machine; else a warning message to that effect will be displayed and Couch_Vertical is ignored. Couch_Vertical is translated based on the target machine characterization.
12. Couch_Lateral	Y	Y	On Import: <ul style="list-style-type: none"> If Couch_Lateral is non-zero, the [Couch Lateral] section must be defined in the machine characterization record for the treatment machine; else a warning message to that effect will be displayed and Couch_Lateral is ignored. Couch_Lateral is translated based on the target machine characterization.
13. Couch_Longitudinal	Y	Y	On Import: <ul style="list-style-type: none"> If Couch_Longitudinal is non-zero, the [Couch Longitude] section must be defined in the machine characterization record for the treatment machine; else a warning message to that effect will be displayed and Couch_Longitudinal is ignored. Couch_Longitudinal is translated based on the target machine characterization.

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
14. Couch_Angle	Y	Y	On Import: <ul style="list-style-type: none"> If Couch_Angle is non-zero, the [Couch Angle] section must be defined in the machine characterization record for the treatment machine; else a warning message to that effect will be displayed and Couch_Angle is ignored. Couch_Angle is translated based on the target machine characterization.
15. Couch_Pedestal	Y	Y	On Import: <ul style="list-style-type: none"> If Couch_Pedestal is non-zero, the [Couch Top] section must be defined in the machine characterization record for the treatment machine; else a warning message to that effect will be displayed and Couch_Pedestal is ignored. Couch_Pedestal is translated based on the target machine characterization.
16. CRC	Y	Y	

2.4 SIMULATION FIELD RECORD [SIM_DEF]

Support for the Data Elements in the Simulation Field Record is indicated in the following table:

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
1. Keyword	Y	Y	"SIM_DEF"
2. Rx_Site_Name	Y	Y	On Import, set if and only if a match is detected with an already defined prescription site. If a match is not found for the specified Rx_Site_Name, a message to that effect will display and the Import process will be disabled.
3. Field_Name	Y	Y	
4. Field_ID	Y	Y	On Import, if Field_ID conflicts with an existing simulation field ID, the import candidate simulation field will be discarded and a warning message will display; otherwise, a new simulation field will be created.
5. Field_Note	Y	Y	
6. Treatment_Machine	Y	Y	On Import, if no match with an already defined treatment machine is detected, a warning message will display and the item will be left blank in the imported simulation field.
7. Gantry_Angle	Y	Y	
8. Collimator_Angle	Y	Y	
9. Field_X_Mode	Y	Y	
10. Field_X	Y	Y	On Import, if Field_X is negative, an error message will display and the Import process will be disabled. On Import, if Field_X_Mode is asymmetric, Field_X is derived from Collimator_X1 and Collimator_X2.
11. Collimator_X1	Y	Y	On Import, if Field_X_Mode is symmetric, Collimator_X1 is derived from Field_X.
12. Collimator_X2	Y	Y	On Import, if Field_X_Mode is symmetric, Collimator_X2 is derived from Field_X.
13. Field_Y_Mode	Y	Y	

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
14. Field_Y	Y	Y	On Import, if Field_Y is negative, an error message will display and the Import process will be disabled. On Import, if Field_Y_Mode is asymmetric, Field_Y is derived from Collimator_Y1 and Collimator_Y2.
15. Collimator_Y1	Y	Y	On Import, if Field_Y_Mode is symmetric, Collimator_Y1 is derived from Field_Y.
16. Collimator_Y2	Y	Y	On Import, if Field_Y_Mode is symmetric, Collimator_Y2 is derived from Field_Y.
17. Couch_Vertical	Y	Y	
18. Couch_Lateral	Y	Y	
19. Couch_Longitudinal	Y	Y	
20. Couch_Angle	Y	Y	
21. Couch_Pedestal	Y	Y	
22. SAD	Y	Y	
23. AP_Separation	Y	Y	
24. PA_Separation	Y	Y	
25. Lateral_Separation	Y	Y	
26. Tangential_Separation	Y	Y	
27. Other_Label_1	Y	Y	
28. SSD_1	Y	Y	
29. SFD_1	Y	Y	
30. Other_Label_2	Y	Y	
31. Other_Measurement_1	Y	Y	
32. Other_Measurement_2	Y	Y	
33. Other_Label_3	Y	Y	
34. Other_Measurement_3	Y	Y	
35. Other_Measurement_4	Y	Y	
36. Other_Label_4	Y	Y	
37. Other_Measurement_5	N	N	
38. Other_Measurement_6	N	N	
39. Blade_x_Mode	Y	Y	
40. Blade_x	Y	Y	On Import, if Blade_x is negative, an error message will display and the Import process will be disabled. On Import, if Blade_x_Mode is asymmetric, Blade_x is derived from Blade_x1 and Blade_x2.
41. Blade_x1	Y	Y	On Import, if Blade_x_Mode is symmetric, Blade_x1 is derived from Blade_x.
42. Blade_x2	Y	Y	On Import, if Blade_x_Mode is symmetric, Blade_x2 is derived from Blade_x.
43. Blade_y_Mode	Y	Y	
44. Blade_y	Y	Y	On Import, if Blade_y is negative, an error message will display and the Import process will be disabled. On Import, if Blade_y_Mode is asymmetric, Blade_y is derived from Blade_y1 and Blade_y2.
45. Blade_y1	Y	Y	On Import, if Blade_y_Mode is symmetric, Blade_y1 is derived from Blade_y.
46. Blade_y2	Y	Y	On Import, if Blade_y_Mode is symmetric, Blade_y2 is derived from Blade_y.

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
47. II_Lateral	Y	Y	
48. II_Longitudinal	Y	Y	
49. II_Vertical	Y	Y	
50. KVP	Y	Y	
51. MA	Y	Y	
52. Seconds	Y	Y	
53. CRC	Y	Y	

2.5 TREATMENT FIELD RECORD [FIELD_DEF]

Support for the Data Elements in the Treatment Field Record is indicated in the following table. The table indicates that some geometry elements may be translated based on Machine Characterizations of the Source and Target machines.

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
1. Keyword	Y	Y	"FIELD_DEF"
2. Rx_Site_Name	Y	Y	On Import, set if and only if a match is detected with an already defined prescription site. If a match is not found for the specified Rx_Site_Name, an error message will display and the Import process will be disabled.
3. Field_Name	Y	Y	
4. Field_ID	Y	Y	On Import, if Field_ID conflicts with an existing treatment field ID, a warning message will display and the user will be asked if the import candidate FIELD_DEF Record should overwrite the existing treatment field. If the user chooses to overwrite, the import candidate will become the new current version of the treatment field. If required by IMPAC's record revision management scheme, the pre-existing treatment field will be saved as a historical version. If there is no field ID conflict, a new treatment field will be created.
5. Field_Note	Y	Y	
6. Field_Dose	Y	Y	On Import, if Field_Dose is negative, a message to that effect will display and the Import process will be disabled. On Import and Export, rounded to the nearest whole cGy.
7. Field_Monitor_Units	Y	Y	On Import, if Field_Monitor_Units is negative, a message to that effect will display and the Import process will be disabled. On Import, if the "Segment MU Calculated" key = "Cumulative", this value is rounded to the nearest precision specified in the 'Fractional MU' key under the [CONSOLE] section for the machine characterization record of the treatment machine.
8. Wedge_Monitor_Units	Y	Y	On Import, <ul style="list-style-type: none"> • If Wedge_Monitor_Units is negative, a message to that effect will display and the Import process will be disabled. • If Wedge_Monitor_Units is greater than Field_Monitor_Units, a message to that effect will display and the Import process will be disabled • If Wedge_Monitor_Units is positive and CONTROL_PT_DEF:Wedge_Position = "IN" is not found in one of the control points, an error message to that effect will display and the Import process will be disabled. • If Wedge_Monitor_Units is positive and the "Motorized Wedge Code" key is not defined under the [CONSOLE] section, an error message to that effect will display and the Import process will be disabled. On Import and Export, rounded to the nearest whole MU.

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
9. Treatment_Machine	Y	Y	<p>On Import, the Treatment_Machine field is used to find a matching treatment machine already defined in the database.</p> <ul style="list-style-type: none"> • If the Scale is IEC and no match is found, a message to that effect will display and the Import process will be disabled. • If the Scale is not IEC and no match is found, a warning message will display. • If CONTROL_PT_DEF:Total_Control_Points > 1, the [IMRT] section must be defined in the machine characterization record for the treatment machine; else a message to that effect will display and the Import process will be disabled.
10. Treatment_Type	Y	Y	
11. Modality	Y	Y	
12. Energy	Y	Y	On Import, if Energy is negative, a message to that effect will display and the Import process will be disabled.
13. Time	Y	Y	On Import, if Time is negative, a message to that effect will display and the Import process will be disabled.
14. Doserate	Y	Y	On Import, if Doserate is negative, a message to that effect will display and the Import process will be disabled.
15. SAD	N	N	
16. SSD	Y	Y	
17. Gantry_Angle	Y	Y	<p>On Import,</p> <ul style="list-style-type: none"> • If a matching CONTROL_PT_DEF record is found for Field_ID, the corresponding CONTROL_PT_DEF:Gantry_Angle value in the first control point is used. • Gantry_Angle is translated based on source and target machine characterizations.
18. Collimator_Angle	Y	Y	<p>On Import,</p> <ul style="list-style-type: none"> • If a matching CONTROL_PT_DEF record is found for Field_ID, the corresponding CONTROL_PT_DEF:Collimator_Angle value in the first control point is used. • Collimator_Angle is translated based on source and target machine characterizations.
19. Field_X_Mode	Y	Y	On Import, if multiple CONTROL_PT_DEF records are found for Field_ID, the corresponding CONTROL_PT_DEF:Field_X_Mode value in the first control point is used.

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
20. Field_X	Y	Y	<p>On Import:</p> <ul style="list-style-type: none"> • If multiple CONTROL_PT_DEF records are found for Field_ID, the corresponding CONTROL_PT_DEF:Field_X value in the first control point is used. • If a MLC_DEF record is found, or a CONTROL_PT_DEF record is found where CONTROL_PT_DEF:MLC_Leaves > 0, Field_X is rounded out to 1 decimal place. Otherwise, it is rounded mathematically to 1 decimal place. • If Field_X is negative, a message to that effect will display and the Import process will be disabled. • Field_X is translated based on source and target machine characterizations. • If Field_X_Mode is asymmetric: <ul style="list-style-type: none"> • If the scale is IEC, subtracting Collimator_X1 from Collimator_X2 derives Field_X. • If the scale is not IEC, adding Collimator_X1 and Collimator_X2 derives Field_X.
21. Collimator_X1	Y	Y	<p>On Import:</p> <ul style="list-style-type: none"> • If multiple CONTROL_PT_DEF records are found for Field_ID, the corresponding CONTROL_PT_DEF:Collimator_X1 value in the first control point is used. • If a MLC_DEF record is found, or a CONTROL_PT_DEF record is found where CONTROL_PT_DEF:MLC_Leaves > 0, Collimator_X1 is rounded out to 1 decimal place. Otherwise, it is rounded mathematically to 1 decimal place. • Collimator_X1 is translated based on source and target machine characterizations. • If Field_X_Mode is symmetric, subtracting the calculated Collimator_X2 from Field_X derives Collimator_X1.
22. Collimator_X2	Y	Y	<p>On Import:</p> <ul style="list-style-type: none"> • If multiple CONTROL_PT_DEF records are found for Field_ID, the corresponding CONTROL_PT_DEF:Collimator_X2 value in the first control point is used. • If a MLC_DEF record is found, or a CONTROL_PT_DEF record is found where CONTROL_PT_DEF:MLC_Leaves > 0, Collimator_X2 is rounded out to 1 decimal place. Otherwise, it is rounded mathematically to 1 decimal place. • Collimator_X2 is translated based on source and target machine characterizations. • If Field_X_Mode is symmetric, dividing Field_X by 2 derives Collimator_X2.

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
23. Field_Y_Mode	Y	Y	On Import, if multiple CONTROL_PT_DEF records are found for Field_ID, the corresponding CONTROL_PT_DEF:Field_Y_Mode value in the first control point is used.
24. Field_Y	Y	Y	<p>On Import:</p> <ul style="list-style-type: none"> • If multiple CONTROL_PT_DEF records are found for Field_ID, the corresponding CONTROL_PT_DEF:Field_Y value in the first control point is used. • If a MLC_DEF record is found, or a CONTROL_PT_DEF record is found where CONTROL_PT_DEF:MLC_Leaves > 0, Field_Y is rounded out to 1 decimal place. Otherwise, it is rounded mathematically to 1 decimal place. • If Field_Y is negative, a message to that effect will display and the Import process will be disabled. Field_Y is translated based on source and target machine characterizations. • If Field_Y_Mode is asymmetric: <ul style="list-style-type: none"> • If the scale is IEC, subtracting Collimator_Y1 from Collimator_Y2 derives Field_Y. • If the scale is not IEC, adding Collimator_Y1 and Collimator_Y2 derives Field_Y.
25. Collimator_Y1	Y	Y	<p>On Import:</p> <ul style="list-style-type: none"> • If multiple CONTROL_PT_DEF records are found for Field_ID, the corresponding CONTROL_PT_DEF:Collimator_Y1 value in the first control point is used. • If a MLC_DEF record is found, or a CONTROL_PT_DEF record is found where CONTROL_PT_DEF:MLC_Leaves > 0, Collimator_Y1 is rounded out to 1 decimal place. Otherwise, it is rounded mathematically to 1 decimal place. • Collimator_Y1 is translated based on source and target machine characterizations. • If Field_Y_Mode is symmetric, subtracting the calculated Collimator_Y2 from Field_Y derives Collimator_Y1.

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
26. Collimator_Y2	Y	Y	<p>On Import:</p> <ul style="list-style-type: none"> • If multiple CONTROL_PT_DEF records are found for Field_ID, the corresponding CONTROL_PT_DEF:Collimator_Y2 value in the first control point is used. • If a MLC_DEF record is found, or a CONTROL_PT_DEF record is found where CONTROL_PT_DEF:MLC_Leaves > 0, Collimator_Y2 is rounded out to 1 decimal place. Otherwise, it is rounded mathematically to 1 decimal place. • Collimator_Y2 is translated based on source and target machine characterizations. • If Field_Y_Mode is symmetric, dividing Field_Y by 2 derives Collimator_Y2.
27. Couch_Vertical	Y	Y	<p>On Import:</p> <ul style="list-style-type: none"> • If Couch_Vertical is non-zero, the [Couch Vertical] section must be defined in the machine characterization record for the treatment machine; else a warning message to that effect will be displayed and Couch_Vertical is ignored. • Couch_Vertical is translated based on source and target machine characterizations.
28. Couch_Lateral	Y	Y	<p>On Import:</p> <ul style="list-style-type: none"> • If Couch_Lateral is non-zero, the [Couch Lateral] section must be defined in the machine characterization record for the treatment machine; else a warning message to that effect will be displayed and Couch_Lateral is ignored. • Couch_Lateral is translated based on source and target machine characterizations.
29. Couch_Longitudinal	Y	Y	<p>On Import:</p> <ul style="list-style-type: none"> • If Couch_Longitudinal is non-zero, the [Couch Longitude] section must be defined in the machine characterization record for the treatment machine; else a warning message to that effect will be displayed and Couch_Longitudinal is ignored. • Couch_Longitudinal is translated based on source and target machine characterizations.
30. Couch_Angle	Y	Y	<p>On Import:</p> <ul style="list-style-type: none"> • If Couch_Angle is non-zero, the [Couch Angle] section must be defined in the machine characterization record for the treatment machine; else a warning message to that effect will be displayed and Couch_Angle is ignored. • Couch_Angle is translated based on source and target machine characterizations.

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
31. Couch_Pedestal	Y	Y	On Import: <ul style="list-style-type: none"> If Couch_Pedestal is non-zero, the [Couch Top] section must be defined in the machine characterization record for the treatment machine; else a warning message to that effect will be displayed and Couch_Pedestal is ignored. Couch_Pedestal is translated based on source and target machine characterizations.
32. Tolerance_Table	Y	Y	
33. Arc_Direction	Y	Y	If Treatment_Type is not Arc or VMAT: <ul style="list-style-type: none"> On Import, Arc_Direction is ignored. On Export, Arc_Direction is set to null.
34. Arc_Start_Angle	Y	Y	On Import, Arc_Start_Angle is translated based on source and target machine characterizations. If Treatment_Type is not Arc or VMAT: <ul style="list-style-type: none"> On Import, Arc_Start_Angle is ignored. On Export, Arc_Start_Angle is set to null.
35. Arc_Stop_Angle	Y	Y	On Import, Arc_Stop_Angle is translated based on source and target machine characterizations. If Treatment_Type is not Arc or VMAT: <ul style="list-style-type: none"> On Import, Arc_Stop_Angle is ignored. On Export, Arc_Stop_Angle is set to null.
36. Arc_MU_Degree	Y	Y	On Import, if Arc_MU_Degree is negative, a message to that effect will display and the Import process will be disabled. If Treatment_Type is not Arc: <ul style="list-style-type: none"> On Import, Arc_MU_Degree is ignored. On Export, Arc_MU_Degree is set to null.
37. Wedge	Y	Y	On Import, if Wedge is null and Dynamic_Wedge is not null, the value in Dynamic_Wedge is moved to Wedge.
38. Dynamic_Wedge	N	N	On Import, if Dynamic_Wedge is not null, a message to that effect will display and the Import process will be disabled.
39. Block	Y	Y	
40. Compensator	Y	Y	
41. e_Applicator	Y	Y	
42. e_Field_Def_Aperture	Y	Y	
43. Bolus	Y	Y	
44. Portfilm_MU_Open	Y	Y	On Import, if Portfilm_MU_Open is negative, a message to that effect will display and the Import process will be disabled. On Import and Export, rounded to the nearest whole MU.
45. Portfilm_Coeff_Open	Y	Y	On Import, if Portfilm_Coeff_Open is negative, a message to that effect will display and the Import process will be disabled. On Import and Export, rounded to the nearest thousandth of cGy/MU. The format after Export is n.nnn.
46. Portfilm_Delta_Open	Y	Y	On Import, if Portfilm_Delta_Open is negative, a message to that effect will display and the Import process will be disabled.

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
47. Portfilm_MU_Treat	Y	Y	On Import, if Portfilm_MU_Treat is negative, a message to that effect will display and the Import process will be disabled. On Import and Export, rounded to the nearest whole MU.
48. Portfilm_Coeff_Treat	Y	Y	On Import, if Portfilm_Coeff_Treat is negative, a message to that effect will display and the Import process will be disabled. On Import and Export, rounded to the nearest thousandth of cGy/MU. The format after Export is n.nnn.
49. CRC	Y	Y	

2.6 DOCUMENT BASED TREATMENT FIELD RECORD [PDF_FIELD_DEF]

Support for the Data Elements in the Document Based Treatment Field Record is indicated in the following table. The table indicates that some elements may be translated based on the Machine Characterization of the Target machines.

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
1. Keyword	Y	Y	"PDF_FIELD_DEF"
2. Rx_Site_Name	Y	Y	On Import, set if and only if a match is detected with an already defined prescription site. If a match is not found for the specified Rx_Site_Name, an error message will display and the Import process will be disabled.
3. Field_Name	Y	Y	
4. Field_ID	Y	Y	On Import, if Field_ID conflicts with an existing treatment field ID, a warning message will display and the user will be asked if the import candidate FIELD_DEF Record should overwrite the existing treatment field. If the user chooses to overwrite, the import candidate will become the new current version of the treatment field. If required by IMPAC's record revision management scheme, the pre-existing treatment field will be saved as a historical version. If there is no field ID conflict, a new treatment field will be created.
5. Field_Note	Y	Y	
6. Field_Dose	Y	Y	On Import, if Field_Dose is negative, a message to that effect will display and the Import process will be disabled. On Import and Export, rounded to the nearest whole cGy.
7. Primary_Dosimeter_Units	Y	Y	On Import, the Primary_Dosimeter_Units must be consistent with the "Meterset Unit" key under the [CONSOLE] section for the machine characterization record of the treatment machine.
8. Meterset	Y	Y	
9. Treatment_Machine	Y	Y	On Import, the Treatment_Machine field is used to find a matching treatment machine already defined in the database. <ul style="list-style-type: none"> If no match is found, a message to that effect will display and the Import process will be disabled.
10. Treatment_Type	Y	Y	On Import, the Treatment_Type must match "Helical", "Fixed Ang" or "Path" as configured with the "Helical", "Fixed Angle", and "Path" keys under the [Beam_] section for the machine characterization record of the treatment machine. <ul style="list-style-type: none"> If no match is found, a message to that effect will display and the Import process will be disabled.
11. Modality	Y	Y	
12. Energy	Y	Y	On Import, if Energy is negative, a message to that effect will display and the Import process will be disabled.
13. Time	N	N	
14. Doserate	Y	Y	On Import, if Doserate is negative, a message to that effect will display and the Import process will be disabled.
15. SAD	N	N	
16. SSD	N	N	
17. Gantry_Angle	N	N	
18. Collimator_Angle	N	N	

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
19. Field_X_Mode	N	N	
20. Field_X	N	N	
21. Collimator_X1	N	N	
22. Collimator_X2	N	N	
23. Field_Y_Mode	N	N	
24. Field_Y	N	N	
25. Collimator_Y1	N	N	
26. Collimator_Y2	N	N	
27. Couch_Vertical	N	N	
28. Couch_Lateral	N	N	
29. Couch_Longitudinal	N	N	
30. Couch_Angle	N	N	
31. Couch_Pedestal	N	N	
32. Tolerance_Table	N	N	
33. Arc_Direction	N	N	
34. Arc_Start_Angle	N	N	
35. Arc_Stop_Angle	N	N	
36. Arc_MU_Degree	N	N	
37. Wedge	N	N	
38. Dynamic_Wedge	N	N	
39. Block	N	N	
40. Compensator	N	N	
41. e_Applicator	N	N	
42. e_Field_Def_Aperture	N	N	
43. Bolus	N	N	
44. Portfilm_MU_Open	N	N	
45. Portfilm_Coeff_Open	N	N	
46. Portfilm_Delta_Open	N	N	
47. Portfilm_MU_Treat	N	N	
48. Portfilm_Coeff_Treat	N	N	
49. Original_Plan_UID	Y	Y	
50. Original_Beam_Number	Y	Y	
51. Original_Beam_Name	Y	Y	
52. CRC	Y	Y	

2.7 MULTI-LEAF COLLIMATOR RECORD [MLC_DEF]

Multi-Leaf Collimator Records are supported only on Import. Support for the Data Elements in the Multi-Leaf Collimator Record is indicated in the following table:

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
1. Keyword	Y	N	"MLC_DEF"

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
2. Field_ID	Y	N	On Import: <ul style="list-style-type: none"> • The Field_ID must match a field ID in an existing treatment field or in an import candidate FIELD_DEF record. • If the field hadn't previously existed in the DB, import the MLC data. • If the field had previously existed and it was overwritten with the related FIELD_DEF record, import the MLC data.
3. MLC_Type	Y	N	On Import, if FIELD_DEF:Treatment_Machine matches an already defined treatment machine, MLC_Type must match the value defined for that treatment machine. If it does not match, an error message will display and the Import process will be disabled.
4. MLC_Leaves	Y	N	On Import, if FIELD_DEF:Treatment_Machine matches an already defined treatment machine, MLC_Leaves must match the value defined for that treatment machine. If it does not match, an error message will display and the Import process will be disabled.
5. MLC_LP ₁ (A ₁)	Y	N	On Import, MLC_LP ₁ is translated based on source and target machine characterizations.
:	Y	N	
54. MLC_LP ₅₀ (A ₅₀)	Y	N	On Import, MLC_LP ₅₀ is translated based on source and target machine characterizations.
55. MLC_LP ₅₁ (B ₁)	Y	N	On Import, MLC_LP ₅₁ is translated based on source and target machine characterizations.
:	Y	N	
104. MLC_LP ₁₀₀ (B ₅₀)	Y	N	On Import, MLC_LP ₁₀₀ is translated based on source and target machine characterizations.
105. CRC	Y	N	

2.8 CONTROL POINT RECORD [CONTROL_PT_DEF]

The Data Elements in the Control Point Record are supported as indicated in the following table.

A special use of the Control Point Record is to indicate that the geometry data in the related FIELD_DEF record is within the IEC Scale; thereby enabling RTPConnect to translate the geometry data from IEC to machine native coordinates. When the Control Point Record is used in this way, MLC_Leaves may be 0 and Scale_Convention must be 2.

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
1. Keyword	Y	Y	"CONTROL_PT_DEF"
2. Field_ID	Y	Y	On Import: <ul style="list-style-type: none"> • The Field_ID must match a field ID in an existing treatment field or in an import candidate FIELD_DEF record. • If the field hadn't previously existed in the DB, import the Control Point data. • If the field had previously existed and it was overwritten with the related FIELD_DEF record, import the Control Point data.
3. MLC_Type	Y	Y	On Import: <ul style="list-style-type: none"> • If FIELD_DEF:Treatment_Machine matches an already defined treatment machine; • If MLC_Type = 11, MLC_Type is set to the value defined for that treatment machine. • Else, MLC_Type must match the value defined for that treatment machine. If it does not match, an error message will display and the Import process will be disabled.
4. MLC_Leaves	Y	Y	On Import, if FIELD_DEF:Treatment_Machine matches an already defined treatment machine, MLC_Leaves must match the value defined for that treatment machine. If it does not match, an error message will display and the Import process will be disabled.
5. Total_Control_Points	Y	Y	On Import: <ul style="list-style-type: none"> • If FIELD_DEF:Treatment_Type is Dynamic, VMAT, DMLC, or StepNShoot, Total_Control_Points must be greater than 1. • Else Total_Control_Points must be 1.
6. Control_Pt_Number	Y	Y	On Import, Control_Pt_Number must be in the correct order.
7. MU_Convention	Y	Y	On Import, if Monitor_Units is sent, MU_Convention must be 1 (fractional). MU_Convention of 2 (absolute centi-MU) is currently not supported. On Export, MU_Convention is set to 1.
8. Monitor_Units	Y	Y	On Import, if Total_Control_Points > 1: <ul style="list-style-type: none"> • Monitor_Units must not be in decreasing order within the Control Point Records. On Import, rounded to the nearest thousandth of MU.

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
9. Wedge_Position	Y	Y	On Import; If Wedge_Position is IN, set TXM:Wedge_In to 1; else set TXM:Wedge_In to zero. If this value changes during a step segment, the “Step Motorized Wedge Position Change” key value in the [IMRT] section of the machine characterization record must be Yes. On Export, if TXM:Wedge_In is 1, set Wedge_Position to IN; else set Wedge_Position to NULL.
10. Energy	Y	Y	On Import; If this value changes during a step segment, the “Step Energy Change” key value in the [IMRT] section of the machine characterization record must be Yes.
11. Doserate	Y	Y	On Import; If this value changes during a step segment, the “Step Doserate Change” key value in the [IMRT] section of the machine characterization record must be Yes.
12. SSD	N	N	
13. Scale_Convention	Y	Y	Scale_Convention can be either 1 (native) or 2 (IEC)
14. Gantry_Angle	Y	Y	On Import; If this value changes during a beam segment, the “IMAT (Gantry Indexed)” or “VMAT (MU Indexed)” key value in the [IMRT] section of the machine characterization record must be Yes. If this value changes during a step segment, the “Step Gantry Angle Change” key value in the [IMRT] section of the machine characterization record must be Yes.
15. Gantry_Dir	Y	Y	On Import, if Total_Control_Points is greater than 1, Gantry_Dir must either be NULL or the same in all Control Point Records except the last record.
16. Collimator_Angle	Y	Y	On Import; If this value changes during a beam segment, the “DMLC Beam Collimator Angle Change” or “VMAT Beam Collimator Angle Change” key value in the [IMRT] section of the machine characterization record must be Yes. If this value changes during a step segment, the “Step Collimator Angle Change” key value in the [IMRT] section of the machine characterization record must be Yes.
17. Collimator_Dir	Y	Y	
18. Field_X_Mode	Y	Y	

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
19. Field_X	Y	Y	On Import: <ul style="list-style-type: none"> • If Field_X is negative, a message will display and the Import process will be disabled. • Field_X is rounded out to 1 decimal place. • Field_X is translated based on source and target machine characterizations. • If Field_X_Mode is asymmetric: <ul style="list-style-type: none"> • If the scale is IEC, subtracting Collimator_X1 from Collimator_X2 derives Field_X. • If the scale is not IEC, adding Collimator_X1 and Collimator_X2 derives Field_X.
20. Collimator_X1	Y	Y	On Import: <ul style="list-style-type: none"> • Collimator_X1 is rounded out to 1 decimal place. • Collimator_X1 is translated based on source and target machine characterizations. • If Field_X_Mode is symmetric, subtracting the calculated Collimator_X2 from Field_X derives Collimator_X1.
21. Collimator_X2	Y	Y	On Import: <ul style="list-style-type: none"> • Collimator_X2 is rounded out to 1 decimal place. • Collimator_X2 is translated based on source and target machine characterizations. • If Field_X_Mode is symmetric, dividing Field_X by 2 derives Collimator_X2.
22. Field_Y_Mode	Y	Y	
23. Field_Y	Y	Y	On Import: <ul style="list-style-type: none"> • If Field_Y is negative, a message to that effect will display and the Import process will be disabled. • Field_Y is rounded out to 1 decimal place. • Field_Y is translated based on source and target machine characterizations. • If Field_Y_Mode is asymmetric: <ul style="list-style-type: none"> • If the scale is IEC, subtracting Collimator_Y1 from Collimator_Y2 derives Field_Y. • If the scale is not IEC, adding Collimator_Y1 and Collimator_Y2 derives Field_Y.
24. Collimator_Y1	Y	Y	On Import: <ul style="list-style-type: none"> • Collimator_Y1 is rounded out to 1 decimal place. • Collimator_Y1 is translated based on source and target machine characterizations. • If Field_Y_Mode is symmetric, subtracting the calculated Collimator_Y2 from Field_Y derives Collimator_Y1.
25. Collimator_Y2	Y	Y	On Import: <ul style="list-style-type: none"> • Collimator_Y2 is rounded out to 1 decimal place. • Collimator_Y2 is translated based on source and target machine characterizations. • If Field_Y_Mode is symmetric, dividing Field_Y by 2 derives Collimator_Y2.
26. Couch_Vertical	N	N	
27. Couch_Lateral	N	N	

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DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
28. Couch_Longitudinal	N	N	
29. Couch_Angle	N	N	
30. Couch_Dir	N	N	
31. Couch_Pedestal	N	N	
32. Couch_Ped_Dir	N	N	
33. MLC_LP ₁ (A ₁)	Y	Y	On Import, MLC_LP ₁ is translated based on source and target machine characterizations.
:	Y	Y	
132. MLC_LP ₁₀₀ (A ₁₀₀)	Y	Y	On Import, MLC_LP ₁₀₀ is translated based on source and target machine characterizations.
133. MLC_LP ₁₀₁ (B ₁)	Y	Y	On Import, MLC_LP ₁₀₁ is translated based on source and target machine characterizations.
:	Y	Y	
231. MLC_LP ₂₀₀ (B ₁₀₀)	Y	Y	On Import, MLC_LP ₂₀₀ is translated based on source and target machine characterizations.
232. CRC	Y	Y	

2.9 MLC SHAPE RECORD [MLC_SHAPE_DEF]

Support for the Data Elements in the MLC Shape Record is indicated in the following table:

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
1. Keyword	Y	Y	"MLC_SHAPE_DEF"
2. Field_ID	Y	Y	On Import: <ul style="list-style-type: none"> • The Field_ID must match a field ID in an existing treatment field or in an import candidate FIELD_DEF record. • If the field hadn't previously existed in the DB, import the Shape data. • If the field had previously existed and it didn't have MLC data, import the Shape data. • If the field had previously existed and it did have MLC data: <ul style="list-style-type: none"> • If the field was overwritten, import the Shape data. • If the Control Point was overwritten, import the Shape data.
3. Control_Pt_Number	Y	Y	
4. Total_Shape_Points	Y	Y	
5. X_Coordinate ₁ 6. Y_Coordinate ₁ : 323. X_Coordinate ₁₆₀ 324. Y_Coordinate ₁₆₀	Y	Y	
325. CRC	Y	Y	

2.10 DOSE TRACKING RECORD [DOSE_DEF]

Support for the Data Elements in the Dose Tracking Record is indicated in the following table:

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
1. Keyword	Y	Y	"DOSE_DEF"
2. Region_Name	Y	Y	If the import candidate Region_Name conflicts with the name of an existing dose tracking site, the import DOSE_DEF Record will be discarded and a warning message will display; otherwise, a new dose tracking site will be created.
3. Region_Prior_Dose	Y	Y	On Import, values greater than 9999 and less than 32768 will be imported, but will cause a display overflow (for example, "####") in some windows. On Import, if Region_Prior_Dose is either negative or greater than 32767, a message to that effect will display and the Import process will be disabled. On Import, rounded to the nearest whole cGy. On Export, the data format is nnnn. Values greater than 9999 will be exported as "####".
4. Field_ID ₁	Y	Y	On Import, if the Field_ID does not match one in an existing treatment field or in an import candidate FIELD_DEF record, a message will display and the Import process will be disabled. On Import, if an import candidate Field_ID conflicts with the one in an existing dose site coefficient, the existing coefficient will be overwritten and a warning message to that effect will display; otherwise, a new dose tracking coefficient will be created. (up to 10 Field_ID, Reg_Coeff pairs)
5. Reg_Coeff ₁	Y	Y	On Import, if Reg_Coeff is negative, a message to that effect will display and the Import process will be disabled. On Import and Export, rounded to the nearest thousandth of cGy/MU. The format after Export is n.nnn. (up to 10 Field_ID, Reg_Coeff pairs)
:			
22. Field_ID ₁₀	Y	Y	
23. Reg_Coeff ₁₀	Y	Y	
24. Actual_Dose	N	N	
25. Actual_Fractions	N	N	
26. CRC	Y	Y	

2.11 DOSE ACTION POINTS [DOSE_ACTION]

Support for the Data Elements in the Dose Action Points Record is indicated in the following table:

DATA ELEMENT LABEL	SUPPORTED		NOTES
	IMPORT	EXPORT	
1. Keyword	Y	Y	"DOSE_ACTION"
2. Region_Name	Y	Y	If an import candidate Region_Name exists, the imported record will be discarded and a warning message will display; otherwise, the dose action point will be added.
3. Action_Dose	Y	Y	On Import, values greater than 9999 and less than 32768 will be imported, but will cause a display overflow (i.e., "####") on some windows. On Import, if Action_Dose is either negative or greater than 32767, a message to that effect will display and the Import process will be disabled. On Export, the data format is nnnn. Values greater than 9999 will be exported as "####".
4. Action_Note	Y	Y	
5. CRC	Y	Y	