TCU Computer Science

MPC Plus Web Interface

Use Cases

Version 2.0

Date: March 25, 2026

Revision History

Date	Version	Description	Author
10/03/2025	1.0	Initial	All
03/25/2026	2.0	Updated to reflect implemented system (API v2.0): corrected UC numbering, added UC-18 (DOC Factors), UC-19 (Timezone), UC-20 (Activity Log), UC-21 (Machine Management); completed UC-5/6/7; removed references to iDrive ETL from user-facing flows; updated sign-off to Accept model.	Alexandre Morales

Use Case List

Admin Use Cases

- UC-1: Create standardized MPC data from historical data
- UC-2: Create standardized MPC data from live data
- UC-3: Modify baseline for a machine check
- UC-4: Modify threshold for a machine check
- UC-5: Modify threshold for warning and alert system *
- UC-18: Manage DOC Factors
- UC-19: Configure application timezone *
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User Use Cases

- UC-8: View all MPC Results (monthly calendar)
- UC-9: View a specific MPC Result (daily detail)
- UC-10: View Beam MPC Results (16e, 6x, 12e, 6e, 9e, 15x, 2.5x, 6xFFF, 10x)
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- UC-20: View activity log (Updates)

** Denotes not part of the MVP.*

Admin Use Cases

UC-1: Create Standardized MPC Data from Historical Data

UC ID & Name	UC-1: Create Standardized MPC Data from Historical Data
Created By	Brae Ogle
Date Created	10/02/2025
Primary Actor	Admin
Secondary Actors	—
Trigger	The Admin submits historical MPC data files to the system for processing.
Description	The Admin wants to standardize historical MPC data so that, regardless of the original file format (.xml, .xim, .csv), the data can be processed and stored in a consistent format within the system.
Preconditions	PRE-1. The Retrieval System and database are active. PRE-2. The Admin is logged into the system.
Postconditions	POST-1. The standardized MPC data is stored in the database and available for future processing.
Main Success Scenario	1. The Admin submits historical MPC data files to the system. 2. The System validates file formats against allowed types (.xml, .xim, .csv). 3. The System processes each file, standardizes the data, and generates a new standardized file. 4. The standardized files are stored in a designated output folder. 5. The System uploads the designated output folder to the database. 6. Use case ends.
Extensions	• 2a. Invalid file format: System rejects the file, notifies the Admin. Admin corrects and retries.
Priority	Low
Frequency of Use	~365 usages initially; rarely used thereafter.
Business Rules	Only authorized Admins may submit historical data.
Assumptions	Historical data is available in a supported format. Admins are trained to upload files.
Open Issues	—

UC-2: Create Standardized MPC Data from Live Data

UC ID & Name	UC-2: Create Standardized MPC Data from Live Data
Created By	Brae Ogle
Date Created	10/02/2025
Primary Actor	System (automated)
Secondary Actors	Admin
Trigger	The Varian machine uploads data to the iDrive.
Description	The system automatically retrieves and standardizes new MPC data from the iDrive so that data from any format (.xml, .xim, .csv) can be processed consistently.
Preconditions	PRE-1. The Retrieval System and database are active. PRE-2. The Varian machine has uploaded new MPC data to the iDrive.
Postconditions	POST-1. The new standardized MPC data is stored in the database.
Main Success Scenario	7. The Varian machine uploads MPC data to the iDrive. 8. The System retrieves files specified by Admin in configuration. 9. The system processes each file, standardizes the data, and generates a new file stored in a designated output folder. 10. The System uploads the designated output folder to the database. 11. Use case ends.
Extensions	• System detects missing or corrupted input files: Alert is generated per BR-8.
Priority	High
Frequency of Use	Average of 5 usages per week.
Business Rules	BR-1: Daily MPC data ingestion must occur automatically without manual user action.
Assumptions	Varian machine is operational and connected.
Open Issues	—

UC-3: Modify Baseline for a Machine Check

UC ID & Name	UC-3: Modify Baseline for a Machine Check
Created By	Madhavam
Date Created	10/03/2025
Primary Actor	Admin
Secondary Actors	System
Trigger	The Admin initiates the process to update the baseline values used for machine performance comparisons.
Description	The Admin wants to modify the baseline reference values for specific MPC checks (e.g., beam output, uniformity). These values are used to compare current machine results against known good performance levels.
Preconditions	PRE-1. The Admin is logged into the system. PRE-2. The system contains existing baseline values for comparison.
Postconditions	POST-1. Updated baseline values are saved to the database. POST-2. All future MPC checks use the new baseline. POST-3. The change is logged with a timestamp and Admin ID.
Main Success Scenario	12. The Admin navigates to the Baseline Configuration panel. 13. The System displays a list of machines and their current baseline values. 14. The Admin selects a machine and a specific check (e.g., beam output). 15. The System displays the current baseline value with contextual metadata. 16. The Admin enters the new baseline value and confirms the update. 17. The System validates the new value (format, range). 18. The System saves the updated value, logs the change, and updates the baseline record. 19. The Admin sees a success confirmation message. 20. Use case ends.
Extensions	• 6a. Invalid input: System rejects, shows error. Admin revises and retries. • 7a. Database error: System alerts Admin and logs the issue.
Priority	High
Frequency of Use	1 user, average of 1 usage per year.
Business Rules	Only Admins can modify baseline values. All baseline changes must be versioned and auditable (BR-6).
Related Use Cases	UC-4: Modify Threshold; UC-13: View Beam MPC Charts
Assumptions	Admin has domain knowledge. Historical results retain original baselines for audit.
Open Issues	Should baseline changes automatically trigger recalculations of past results?

UC-4: Modify Threshold for a Machine Check

UC ID & Name	UC-4: Modify Threshold for a Machine Check
Created By	Madhavam
Date Created	10/03/2025
Primary Actor	Admin
Secondary Actors	System
Trigger	The Admin initiates the process to adjust tolerance thresholds for a specific machine check.
Description	The Admin wants to modify threshold values (warning or alert ranges) for various MPC check parameters. Thresholds define acceptable performance variance for QA compliance and trigger alerts when exceeded.
Preconditions	PRE-1. The Admin is logged into the system. PRE-2. The system contains active baseline and threshold configurations. PRE-3. Existing checks are mapped to machines and thresholds.
Postconditions	POST-1. Threshold values are updated in the database via the /thresholds endpoint. POST-2. New thresholds are used in future MPC result evaluations. POST-3. Audit trail is created for the update.
Main Success Scenario	21. The Admin accesses the Threshold Management interface. 22. The System displays machines and their current threshold values (retrieved from GET /thresholds/all). 23. The Admin selects a machine and a specific check to update. 24. The System shows current warning and alert thresholds. 25. The Admin inputs new threshold values. 26. The System validates that warning < alert, and both are within bounds. 27. The System saves the updated thresholds via POST /thresholds (upsert) and logs the change. 28. The System confirms the update. Use case ends.
Extensions	• 6a. Invalid threshold logic (alert < warning): System rejects and shows guidance. Admin revises. • 7a. Save fails: System alerts Admin.
Priority	High
Frequency of Use	1 user, average of 1 usage per year.
Business Rules	Thresholds ≥ 0. All changes logged. Historical evaluations retain original threshold (BR-6).
Related Use Cases	UC-3: Modify Baseline; UC-5: Modify Alert System Threshold; UC-13: View Beam MPC Charts
Assumptions	Admin understands machine performance ranges. Thresholds are reviewed periodically.
Open Issues	Should there be an approval process for threshold changes?

UC-5: Modify Threshold for Warning and Alert System

Note: This use case was previously incomplete. Filled in based on the implemented /thresholds API.

UC ID & Name	UC-5: Modify Threshold for Warning and Alert System
Created By	Team
Date Created	10/03/2025
Primary Actor	Admin
Secondary Actors	System
Trigger	The Admin decides that system-wide warning or alert notification thresholds need adjustment.
Description	The Admin modifies the threshold values that determine when the system generates automated warnings or hard alerts (e.g., email, on-screen notification). These are separate from per-check machine thresholds and affect global notification behavior.
Preconditions	PRE-1. The Admin is logged into the system. PRE-2. Warning/alert threshold configuration exists in the system.
Postconditions	POST-1. New notification threshold values are persisted. POST-2. Future alert evaluations use the updated thresholds. POST-3. Change is logged with Admin ID and timestamp.
Main Success Scenario	29. The Admin navigates to the Alert Configuration section. 30. The System retrieves and displays current warning and alert threshold levels. 31. The Admin selects the threshold type to modify (warning or alert). 32. The Admin enters the new threshold value. 33. The System validates the value (non-negative, warning < alert). 34. The System saves the threshold via POST /thresholds (upsert) and logs the change. 35. The System confirms the update. Use case ends.
Extensions	• 5a. Invalid value: System shows error. Admin revises and retries.
Priority	High — Not MVP
Frequency of Use	1 user, average of 1 usage per year.
Business Rules	BR-8: System must generate alerts when a value exceeds tolerance or when a daily MPC has not been signed off by deadline.
Related Use Cases	UC-4: Modify Threshold for a Machine Check
Assumptions	Admin understands alerting requirements.
Open Issues	—

User Use Cases

UC-8: View All MPC Results (Monthly Calendar)

UC ID & Name	UC-8: View All MPC Results (Monthly Calendar)
Created By	Sameep Shah
Date Created	10/02/2025
Primary Actor	User
Secondary Actors	—
Trigger	The User selects a month, year, and machine to view overall MPC result status.
Description	The User wants a calendar-style overview of all MPC check statuses for a selected month, machine, and year. Each day shows aggregated status (pass/fail/pending) and approval state. Sourced from GET /results.
Preconditions	PRE-1. The User is logged into the system.
Postconditions	POST-1. Monthly aggregated MPC results are displayed to the User.
Main Success Scenario	36. The User navigates to the Results dashboard. 37. The User selects a machine, month, and year. 38. The System retrieves aggregated daily check statuses via GET /results?month=&year=&machineId=. 39. The System displays a calendar view with per-day status, approval state, fail count, and result date. 40. Use case ends.
Extensions	• 3a. No data for selected period: System informs the User that no results are available.
Priority	High
Frequency of Use	1 user, average of 30 usages per week.
Associated Information	

Property	Data Type	Editable	Notes
ResultDate	Date	No	Date of the MPC run
Verified	Boolean	No	Whether checks are accepted
FailCount	Integer	No	Number of failed checks for that day
Status	String	No	Aggregated pass/fail/pending

Related Use Cases	UC-9: View a specific MPC Result
Assumptions	—
Open Issues	—

UC-9: View a Specific MPC Result (Daily Detail)

UC ID & Name	UC-9: View a Specific MPC Result (Daily Detail)
Created By	Sameep Shah
Date Created	10/02/2025
Primary Actor	User
Secondary Actors	—
Trigger	The User selects a specific day from the monthly calendar (UC-8).
Description	The User wants to view the full details of MPC checks for a specific day — both beam checks and geometry checks — to assess individual check results.
Preconditions	PRE-1. The User is logged into the system.
Postconditions	POST-1. The details of the specified day's MPC results are displayed.
Main Success Scenario	41. The User selects a day from UC-8 monthly calendar view. 42. The System retrieves beam data via GET /beams?machineId=&date= and geometry checks via GET /geochecks?machine-id=&date=. 43. The System displays grouped check results (grouped by ~2 minutes proximity) with dynamic PASS/FAIL status based on current thresholds. 44. Use case ends.
Extensions	• 2a. No data for selected date: System notifies the User.
Priority	High
Frequency of Use	1 user, average of 25 usages per week.
Related Use Cases	UC-10: View Beam MPC Results; UC-16: Accept MPC Data
Assumptions	PASS/FAIL status is computed dynamically against current threshold configurations.
Open Issues	—

UC-10: View Beam MPC Results

UC ID & Name	UC-10: View Beam MPC Results (16e, 6x, 12e, 6e, 9e, 15x, 2.5x, 6xFFF, 10x)
Created By	Sameep Shah
Date Created	10/02/2025
Primary Actor	User
Secondary Actors	—
Trigger	The User indicates to view the details of a Beam MPC Result.
Description	The User views beam check details for a specific energy type from GET /beams, filtered by type (e.g., 6e, 9e, 10x). Results are grouped by temporal proximity and include dynamic PASS/FAIL evaluation against configured thresholds.
Preconditions	PRE-1. The User is logged into the system.
Postconditions	POST-1. The details of the specified Beam MPC results are displayed.
Main Success Scenario	45. The User navigates to a specific MPC result via UC-9. 46. The System displays beam energy types associated with the MPC result. 47. The User selects a specific beam energy type. 48. The System retrieves and displays beam details via GET /beams?type=&machineId=&date=. 49. Use case ends.
Extensions	• 4a. No data for selected beam type/date: System notifies the User.
Priority	High
Frequency of Use	1 user, average of 25 usages per week.
Associated Information	

Property	Data Type	Editable	Notes
BeamOutputChange (%)	Float	No	Beam output deviation from baseline
BeamUniformityChange (%)	Float	No	Uniformity deviation from baseline
Status	String	No	PASS/FAIL — computed dynamically vs. thresholds
BeamType	String	No	e.g., 6e, 9e, 10x, 6xFFF
MachineId	String	No	Machine identifier
Timestamp	DateTime	No	Time of the check

Related Use Cases	UC-9: View Specific MPC Result; UC-13: View Beam MPC Charts; UC-16: Accept MPC Data
Assumptions	—
Open Issues	—

UC-11: View Leaf MPC Results

UC ID & Name	UC-11: View Leaf MPC Results
Created By	Sameep Shah
Date Created	10/02/2025
Primary Actor	User
Secondary Actors	—
Trigger	The User indicates to view leaf MPC results.
Description	The User views individual MLC leaf position data from geometry checks. Leaf data is included as part of the GeoCheck object returned from GET /geochecks.
Preconditions	PRE-1. The User is logged into the system.
Postconditions	POST-1. The details of the specified Leaf MPC results are displayed.
Main Success Scenario	50. The User navigates to an MPC Result via UC-9. 51. The System displays available leaf data from geometry checks. 52. The User views the list and selects a specific leaf MPC result. 53. The System retrieves and displays details via GET /geochecks?machine-id=&date=, including MLC leaf data. 54. Use case ends.
Extensions	• 4a. No leaf data available: System notifies the User.
Priority	High
Frequency of Use	1 user, average of 15 usages per week.
Associated Information	Leaf data is embedded within GeoCheck objects. Verify final field names with backend team.
Related Use Cases	UC-12: View Geometry Check Results; UC-14: View Leaf MPC Charts
Assumptions	Leaf data is confirmed to be part of GeoCheck payload.
Open Issues	Confirm final leaf property field names with data model.

UC-12: View Geometry Check Results

UC ID & Name	UC-12: View Geometry Check Results
Created By	Tristan Gonzalez
Date Created	10/02/2025
Primary Actor	User
Secondary Actors	Varian Machine
Trigger	The User requests to view geometry check results.
Description	The User views geometry check results to confirm machine accuracy and QA protocol compliance. Data is retrieved from GET /geochecks. Results include gantry angle accuracy, collimator alignment, laser alignment, and isocenter verification.
Preconditions	PRE-1. The User is logged into the system. PRE-2. Geometry checks have been run and uploaded.
Postconditions	POST-1. Geometry check data is displayed. POST-2. The User can export or save results (PDF/CSV).
Main Success Scenario	55. The User selects the option to view geometry check results. 56. The System retrieves geometry check data from GET /geochecks?machine-id=&date=. 57. The System validates the data is complete and uncorrupted. 58. The System displays results in a clear format (tables, summary) with pass/fail indicators. 59. The User reviews the results. 60. The User optionally exports results (PDF/CSV) for reporting or compliance. 61. Use case ends.
Extensions	• 2a. No geometry check data available: System alerts User. • 3a. Data validation error: System alerts User; User may request re-upload. • 6a. Export not available: System informs User.
Priority	High
Frequency of Use	Daily or weekly per QA schedule.
Business Rules	Only authorized Users can view geometry check data. Results are read-only once uploaded (BR-2). Data retained for compliance (BR-7).
Related Use Cases	UC-13: View Beam MPC Charts; UC-15: View Geometry Check Charts; UC-16: Accept MPC Data; UC-17: Generate Report
Assumptions	Varian machine successfully uploads geometry check results.
Open Issues	—

UC-13: View Beam MPC Charts

UC ID & Name	UC-13: View Beam MPC Charts
Created By	Alexandre Morales
Date Created	10/03/2025
Primary Actor	User
Secondary Actors	—
Trigger	The User selects to view charts/visualizations of Beam MPC Results.
Description	The User views graphical visualizations of Beam MPC Results — beam output, uniformity, and performance trends — using data from GET /beams filtered by date range. Charts support at least 3 years of historical data.
Preconditions	PRE-1. The User is logged into the system. PRE-2. Beam MPC data has been ingested and is available.
Postconditions	POST-1. Charts and visualizations of Beam MPC results are displayed.
Main Success Scenario	62. The User navigates to the Beam MPC Results section. 63. The System displays available beam performance data with chart options. 64. The User selects a beam type and/or date range. 65. The System retrieves data via GET /beams?type=&machineId=&startDate=&endDate=. 66. The System generates and displays interactive charts: beam output change over time, beam uniformity trends, comparison against baseline and tolerance thresholds, historical data overlays. 67. The User interacts with charts (zoom, pan, select date ranges). 68. The System updates visualizations based on user interactions. 69. Use case ends.
Extensions	• 3a. User selects multiple machines: System shows side-by-side or overlay charts. • 5a. No data for selected period: System shows message. User selects different period.
Priority	High
Frequency of Use	1 user, average of 10–15 usages per week.
Business Rules	BR-1: Charts display data per baseline/tolerance settings. BR-2: Supports 3+ years of archived data. BR-3: Out-of-tolerance data visually highlighted.
Related Use Cases	UC-1, UC-2: Data ingestion; UC-9: View MPC Result; UC-10: View Beam MPC Results; UC-16: Accept; UC-17: Generate Report
Assumptions	System has ingested and standardized beam MPC data from Varian machines.
Open Issues	OI-1: Optimal chart types based on user feedback. OI-2: Specific threshold markers for auto-highlighting.

UC-14: View Leaf MPC Charts

UC ID & Name	UC-14: View Leaf MPC Charts
Created By	Alex Lee
Date Created	10/03/2025
Primary Actor	User (Oncologist/Physicist)
Secondary Actors	—
Trigger	The User selects to view Leaf MPC Charts.
Description	The User views leaf MPC charts to analyze beam performance, leaf positioning accuracy, and QA metrics visually. Data sourced from GET /geochecks (leaf data embedded in GeoCheck objects).
Preconditions	PRE-1. The User is logged into the system. PRE-2. The User has 'view' privilege for MPC data. PRE-3. Leaf MPC data is stored in the database.
Postconditions	POST-1. Leaf MPC Charts are displayed.
Main Success Scenario	70. The User selects the option to view Leaf MPC Charts. 71. The System retrieves available Leaf MPC Results via GET /geochecks. 72. The User chooses a specific result set to view. 73. The System generates Leaf MPC Charts: leaf IDs with position values, position errors vs. tolerance limits, pass/fail indicators, trend lines for deviations. 74. The User reviews charts using zoom, filter by leaf, date, tolerance. 75. If needed, the User includes charts in a report (UC-17). 76. The System logs the viewing activity for auditing. 77. Use case ends.
Extensions	• 4a. No chart data: System notifies User that chart cannot be displayed.
Priority	High
Frequency of Use	1 user, 10–15 usages per week.
Business Rules	BR-1: Only authorized users may view Leaf MPC charts. BR-2: Charts are generated from validated data only.
Related Use Cases	UC-9: View MPC Result; UC-11: View Leaf MPC Results; UC-16: Accept; UC-17: Generate Report
Assumptions	Leaf MPC results are generated and stored. Users have viewing permissions.
Open Issues	OI-1: Should real-time streaming charts be included or only historical?

UC-15: View Geometry Check Charts

UC ID & Name	UC-15: View Geometry Check Charts
Created By	Alex Lee
Date Created	10/03/2025
Primary Actor	User (Oncologist/Physicist)
Secondary Actors	Other Admins/Physicists/Varian
Trigger	The User selects to view graphical charts of Geometry Check results.
Description	The User views Geometry Check charts to verify system alignment, imaging isocenter, and geometric QA parameters. Data sourced from GET /geochecks.
Preconditions	PRE-1. The User is logged into the system. PRE-2. User has privilege to view Geometry Check charts. PRE-3. Geometry check results are processed and stored. PRE-4. Chart visualization module is available.
Postconditions	POST-1. Selected Geometry Check charts are displayed.
Main Success Scenario	78. The User selects the option to view Geometry Check Charts. 79. The System retrieves available Geometry Check results via GET /geochecks. 80. The User chooses a specific dataset. 81. The System generates Geometry Check Charts: isocenter alignment, gantry angle accuracy, imaging vs. treatment isocenter comparisons, deviation indicators. 82. The User reviews with zoom, filter by test date, highlight out-of-tolerance. 83. If needed, the User includes charts in a report (UC-17). 84. The System logs viewing activity. 85. Use case ends.
Extensions	• 4a. No chart data: System notifies User.
Priority	High
Frequency of Use	Multiple times per week by QA physicists.
Business Rules	BR-1: Only authorized users may view. BR-2: Charts generated only from validated data.
Related Use Cases	UC-9: View MPC Result; UC-12: View Geometry Check Results; UC-16: Accept; UC-17: Generate Report
Assumptions	Geometry check results are collected and stored. Visualization libraries are functional.
Open Issues	—

UC-16: Accept (Sign Off on) MPC Data

Note: Implemented as POST /beams/accept and POST /geochecks/accept. User accepts batches of beam or geometry check records. The term 'Accept' is used throughout the system; 'Sign off' remains valid in QA documentation context.

UC ID & Name	UC-16: Accept (Sign Off on) MPC Data
Created By	Tristan Gonzalez
Date Created	10/02/2025
Primary Actor	User (Physicist/Supervisor)
Secondary Actors	System
Trigger	The User initiates the process to accept completed MPC data.
Description	The User confirms that reviewed MPC check data (beams and/or geometry checks) has been verified. By accepting, the User provides confirmation along with an automatically stored timestamp and username for compliance and audit purposes. Implemented via POST /beams/accept and POST /geochecks/accept.
Preconditions	PRE-1. The User is logged into the system. PRE-2. MPC data has been generated and uploaded. PRE-3. The User has sufficient permissions to accept data.
Postconditions	POST-1. Selected MPC records are marked as accepted. POST-2. The User's name and timestamp are recorded. POST-3. Accepted data is locked against modification (BR-4).
Main Success Scenario	86. The User reviews MPC results via UC-9 or UC-10/UC-12. 87. The User selects one or more beam checks and/or geometry checks to accept. 88. The System presents a confirmation prompt listing the selected records. 89. The User confirms acceptance. 90. The System submits POST /beams/accept or POST /geochecks/accept with the selected IDs. 91. The System records the User's name, role, and current timestamp for each accepted record. 92. The System marks each record as accepted and stores the acceptance in the audit log. 93. The System displays a confirmation with any errors for records that could not be accepted. 94. Use case ends.
Extensions	• 2a. No MPC data available: System notifies User. • 3a. User identifies issues: User cancels and flags data for review/correction. • 5a. User cancels: System aborts without recording changes. • 7a. Database error writing acceptance: System alerts User. User retries once resolved.
Priority	High
Frequency of Use	Daily/weekly per QA schedule; required for compliance.
Business Rules	BR-4: Daily MPC results cannot be marked complete until a credentialed physicist accepts them. BR-5: Only authorized users may accept data. BR-6: All acceptances must be timestamped and associated with a unique user account.

Related Use Cases	UC-9: View MPC Result; UC-12: View Geometry Checks; UC-17: Generate Report
Assumptions	System clock is accurate and synchronized. User has reviewed results before accepting.
Open Issues	—

UC-17: Generate a Report of MPC Checks

Note: Implemented via POST /reports/generate. Returns a single PDF for single-day data or a ZIP archive (one PDF per day) for multi-day ranges. Not MVP.

UC ID & Name	UC-17: Generate a Report of MPC Checks
Created By	Team
Date Created	10/03/2025
Primary Actor	User
Secondary Actors	System
Trigger	The User requests a formal PDF report of MPC check data for a given date range and machine.
Description	The User generates a downloadable PDF report (or ZIP of PDFs for multi-day ranges) summarizing MPC check results for compliance, record-keeping, or clinical review.
Preconditions	PRE-1. The User is logged into the system. PRE-2. MPC data exists for the requested date range and machine.
Postconditions	POST-1. A PDF (or ZIP) report is generated and returned for download.
Main Success Scenario	95. The User navigates to the Report Generation section. 96. The User specifies the machine ID and date range (single day or multi-day). 97. The User submits the report request via POST /reports/generate. 98. The System retrieves MPC data for the specified parameters. 99. The System generates a PDF for single-day requests, or a ZIP with one PDF per day for multi-day requests. 100. The System returns the file for download. 101. Use case ends.
Extensions	• 4a. Invalid date range or missing machine ID: System returns 400 Bad Request. • 5a. Internal error during generation: System returns 500 and alerts User.
Priority	High — Not MVP
Frequency of Use	As needed for compliance or review.
Business Rules	BR-7: All MPC numerical results and sign-off records must be retained per clinic policy.
Related Use Cases	UC-9: View MPC Result; UC-16: Accept MPC Data
Assumptions	PDF generation library is available and functional.
Open Issues	Define which data fields and charts are included in each report type.

New Use Cases (from Implemented System)

UC-18: Manage DOC Factors (Dose Output Correction)

Note: New use case — not in original document. Added based on implemented /docfactors API endpoints.

UC ID & Name	UC-18: Manage DOC Factors (Dose Output Correction)
Created By	Team
Date Created	03/25/2026
Primary Actor	Admin
Secondary Actors	System
Trigger	The Admin needs to add, update, or remove a Dose Output Correction (DOC) factor for a machine and beam variant.
Description	DOC factors are correction multipliers applied to beam output measurements for specific machine/beam variant combinations over a date range. When a new factor is created, the system automatically adjusts date ranges of existing factors for the same machine and beam variant. Implemented via GET, POST, PUT, DELETE /docfactors.
Preconditions	PRE-1. The Admin is logged into the system. PRE-2. The machine and beam variant referenced in the DOC factor exist in the system.
Postconditions	POST-1. The DOC factor is saved/updated/deleted. POST-2. Existing DOC factors for the same machine/variant have date ranges automatically adjusted.
Main Success Scenario	102. The Admin navigates to the DOC Factors management page. 103. The System displays existing DOC factors via GET /docfactors?machineId=. 104. To add: Admin selects a beam check via GET /beams/by-date, enters the correction factor value, and submits via POST /docfactors. 105. The System automatically adjusts date ranges of existing factors for the same machine/variant. 106. The System confirms creation and displays the updated list. 107. To update: Admin selects an existing factor, modifies the value, and submits via PUT /docfactors/{id}. 108. To delete: Admin selects a factor and confirms deletion via DELETE /docfactors/{id}. 109. Use case ends.
Extensions	• 3a. Referenced machine or beam variant does not exist: System returns error. • 4a. Date range conflict cannot be resolved: System alerts Admin.
Priority	High
Frequency of Use	As needed when machine output calibration changes.
Business Rules	BR-2: Correction factors must be logged, reversible, and auditable. BR-5: Only Admins may manage DOC factors.
Related Use Cases	UC-3: Modify Baseline; UC-10: View Beam MPC Results
Assumptions	Admin understands the clinical significance of DOC factors.
Open Issues	Define validation range for DOC factor values.

UC-19: Configure Application Timezone

Note: New use case — not in original document. Added based on implemented /settings/timezone API endpoints. Not MVP.

UC ID & Name	UC-19: Configure Application Timezone
Created By	Team
Date Created	03/25/2026
Primary Actor	Admin
Secondary Actors	System
Trigger	The Admin needs to configure the timezone used for displaying timestamps throughout the application.
Description	The Admin sets the IANA timezone string for the application (e.g., America/Chicago). All MPC timestamps displayed to users will be converted to this timezone. Implemented via GET and PUT /settings/timezone.
Preconditions	PRE-1. The Admin is logged into the system.
Postconditions	POST-1. The timezone is persisted in the system settings. POST-2. All subsequent timestamp displays reflect the new timezone.
Main Success Scenario	110. The Admin navigates to Application Settings. 111. The System retrieves and displays the current timezone via GET /settings/timezone. 112. The Admin enters a valid IANA timezone string and submits via PUT /settings/timezone. 113. The System validates the timezone string. 114. The System persists the new timezone setting. 115. The System confirms the update. Use case ends.
Extensions	• 4a. Invalid or unknown timezone: System returns 400 Bad Request. Admin corrects and retries.
Priority	Medium — Not MVP
Frequency of Use	Rarely — only during initial setup or daylight saving changes.
Business Rules	BR-6: Setting changes should be logged with Admin ID and timestamp.
Related Use Cases	UC-8: View All MPC Results; UC-16: Accept MPC Data
Assumptions	System uses IANA timezone database for validation.
Open Issues	—

UC-20: View Activity Log (Updates)

Note: New use case — not in original document. Added based on implemented /updates API endpoints.

UC ID & Name	UC-20: View Activity Log (Updates)
Created By	Team
Date Created	03/25/2026
Primary Actor	User / Admin
Secondary Actors	System
Trigger	The User or Admin wants to review recent system activity for audit or awareness purposes.
Description	The system maintains an activity log of entries (updates) that record notable actions or events. Users and Admins can view, create, or manage these log entries via GET, POST, PUT, DELETE /updates.
Preconditions	PRE-1. The User or Admin is logged into the system.
Postconditions	POST-1. Activity log entries are displayed.
Main Success Scenario	116. The User navigates to the Activity Log section. 117. The System retrieves all activity log entries via GET /updates. 118. The System displays the entries in reverse chronological order. 119. The User reviews entries. Admins may create, edit, or delete entries as needed. 120. Use case ends.
Extensions	• 2a. No updates found: System displays empty state message. • 4a. Admin edits/deletes entry: System confirms via PUT or DELETE /updates.
Priority	Medium
Frequency of Use	As needed for audit or review.
Business Rules	BR-6: All configuration changes must be traceable via audit log.
Related Use Cases	UC-16: Accept MPC Data; UC-3/4: Modify Baselines/Thresholds
Assumptions	Activity log entries are created by the system or authorized Admins.
Open Issues	Define which system events automatically generate log entries.

UC-21: Manage Machines

Note: New use case — not in original document. Added based on implemented /machines API endpoints.

UC ID & Name	UC-21: Manage Machines
Created By	Team
Date Created	03/25/2026
Primary Actor	Admin
Secondary Actors	System
Trigger	The Admin needs to add, update, or remove a Varian TrueBeam machine from the system.
Description	The Admin manages the set of machines tracked by the system. Machines are referenced by all MPC checks (beams, geometry checks), thresholds, DOC factors, and reports. Implemented via GET, POST, PUT, DELETE /machines.
Preconditions	PRE-1. The Admin is logged into the system.
Postconditions	POST-1. Machine record is created/updated/deleted. POST-2. All MPC data remains associated with correct machine IDs.
Main Success Scenario	121. The Admin navigates to the Machine Management section. 122. The System retrieves and displays all machines via GET /machines. 123. To add: Admin enters machine details and submits via POST /machines. 124. To update: Admin selects a machine, modifies details, and submits via PUT /machines/{id}. 125. To delete: Admin selects a machine and confirms deletion via DELETE /machines/{id}. 126. The System confirms the operation. Use case ends.
Extensions	• 3a. Machine ID already exists: System returns 409 Conflict. • 5a. Machine has existing data references: System warns Admin before deletion.
Priority	High
Frequency of Use	Infrequent — during system setup or equipment changes.
Business Rules	BR-9: All machines must use the same standardized data model. BR-5: Only Admins may manage machines.
Related Use Cases	UC-3: Modify Baseline; UC-4: Modify Threshold; UC-18: Manage DOC Factors
Assumptions	Machine IDs are consistent with iDrive data and Varian system identifiers.
Open Issues	Should machine deletion be allowed if historical MPC data exists?

Business Rules

BR-1: Daily MPC Data Ingestion Rule

The system must automatically ingest all new MPC output files (.xml, .xim, .csv) from the iDrive once per MPC run, without requiring manual user actions.

BR-2: Data Integrity Rule

All calibration data ingested must remain unaltered from original Varian-generated values unless the user explicitly enables Chamber Output Correction. Corrections must be logged, reversible, and auditable.

BR-3: Threshold Enforcement Rule

The system must compare all measured values against configured threshold tolerances and clearly flag results outside acceptable ranges.

BR-4: User Accept Rule

A machine's daily MPC results cannot be marked complete until a credentialed physicist or authorized technician performs a digital acceptance using their authenticated account.

BR-5: Role-Based Access Rule

System configuration operations (modifying baselines, thresholds, machine profiles, correction factors) may only be performed by users in supervisory or admin roles.

BR-6: Compliance Traceability Rule

All acceptances, configuration changes, and threshold adjustments must be timestamped and associated with a unique user account to maintain auditability for state compliance.

BR-7: Data Retention Rule

The system must retain all MPC numerical results and acceptance records indefinitely (or until clinic policy dictates), while storing large image files selectively to avoid excessive storage.

BR-8: Alert Generation Rule

The system must automatically generate alerts when: (a) a value exceeds its allowed tolerance, (b) a machine's daily MPC has not been accepted by the required deadline, (c) the ETL pipeline detects missing or corrupted input files.

BR-9: Multi-Machine Consistency Rule

All machines across all sites must be processed using the same standardized data model to ensure consistency in analytics, visualization, and reporting.

BR-10: System Access Rule

Only authenticated users on The CenterTX network may access the web interface. External access is prohibited.