



Customer Release Notes for DP-1007 CRN-0177

This document describes:

- Changes to ZAP-X® system since the prior release (DP-1006).
- New features in the ZAP-X® software in the DP-1007 release.
- Known issues and workarounds.

1. Compatibility

ZAP-X® software is organized into five major software components. These release notes specifically describe the following software component versions:

SW Component	Version
Treatment Planning Software	1.8.57.11300
Treatment Delivery Software	1.8.54.18792
Broker	1.8.20.1668
Agent	2.0.20-25
Installer	20230425.2

2. Content of DP-1007

ZAP revised the ZAP-X® software to address the defect previously noted in the medical device correction notice CC-3007, which was previously provided to all ZAP-X® customers.

DP-1007 provides a correction to the software defect noted in CC-3007. The defect was related to the alignment of the patient position between isocenters.

The most recent release of ZAP-X® software is the DP-1007 release. The release contains the feature presented below.



2.1. DP-1007 Features

Treatment Delivery includes the following features:

- **Improved alignment performance**
 - Added redundant 6D solvers to improve robustness of patient pose predictions
 - Increased number of XYZ and 6D solver iterations to improve prediction quality
 - Enhanced kV image pre-processing to improve kV and DRR image alignment
- **Transitional Alignment and Multi-Image Tracking review screen**
 - Added a screen for the user to review the quality of Transitional Alignment and Multi-Image Tracking with the same tools available that are available during auto-align
- **DRR generation optimization**
 - Streamlined the loading of CT images and the generation of DRR images to reduce the run-time of both patient tracking and alignment
- **Improved tracking diagnostics**
 - The system will automatically acquire more images before presenting the results to the user if rotational changes during Transitional Alignment and Multi-Image Tracking are greater than 2°
- **Adjust table pitch in Daily QA screen**
 - Added the ability to adjust the table pitch angle in the Daily QA screen
- **Large rotation warning**
 - After any Auto Alignment or Transitional Alignment, the system will present a warning to the user if the patient's head is rotated in any direction by more than 3° compared to the planning CT



Treatment Planning includes the following features:

- **Customizable contour colors**
 - Allow user to select a contour color when creating a new structure
 - Allow user to modify the contour color from contour list view
- **Tracking Contour**
 - Added a Tracking Contour VOI type which defines the parts of the CT that will be used during treatment to align and track the patient. The Tracking Contour can be reviewed by enabling its visibility in the contour list. It can be edited using the bumper tool
- **Usability improvements – keyboard behaviors**
 - Add Contour
 - Enter key: only when editing new contour name, will behave as clicking the OK button
 - Esc key: works the same as the Cancel button
 - Contour List
 - Esc key: works the same as the Back button
 - Plan Save/ Plan Approve
 - Inside a textbox, keyboard input "Enter" will behave like clicking on the green check button (save plan)
 - Escape key: works as the back button
 - Prescription
 - Inside a textbox, keyboard input "Enter" will behave like clicking on the green check button (prescribe)
 - Patient Information
 - Enter key: Will toggle the Patient Information



2.2. Bug Fixes

2.2.1. CRN-0177 Bug Fixes

CRN-0177 contains fixes for the following issues observed in the field:

Title	ID
Extract button in Treatment View is disabled when LINAC is not ready	43010
Door and shell cannot open after E-stop	24513
Incorrect Pendant UI animation	42888

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2.2.2. CRN-0171 Bug Fixes

CRN-0171 contains fixes for the following issues observed in the field:

Title	ID
Pendant requires restart after every system power up	21312
Pendant - EVENT_TABLE_COMM_ERROR	21313
Table motion did not stop when control was removed from Pendant	21314
Inconsistent initial table position between DP-1006 and DP-1007	21421



SW Component	Version
Treatment Planning Software	1.8.57.11300
Treatment Delivery Software	1.8.54.18769
Broker	1.8.20.1668
Agent	2.0.20-25
Installer	20230108.1

2.2.3. DP-1007 Bug Fixes

DP-1007 contains fixes for the following issues observed in the field:

Title	ID
Last approved date for Plan date in the reports	3986
Communication error during beam delivery	4702
User can prescribe a value larger 100%	11649
Cancelling a step in Optimize does not always cancel subsequent steps	12209
Table not disabled while in water tank tab of Daily QA	12633
Gantry velocity reporting errors due too large movements	13088
Cancel option is not available on clicking Solve from Inverse Planning	13126
Treatment View unexpectedly closed during alignment due to mishandling of OpenCV images	13150
The cursor not populated in the text box after confirming save without entering a plan name	13171
KV Images not re-submitted if Broker goes offline during delivery.	13194
Deleting a contour from contour list ends up in wrong UI state	13273



Title	ID
Plan summary panel bottom list header checkbox not updating the boxes in the list items	13274
Three images for transitional alignment	13390
KV images taken during transitional alignment are not 30 degrees apart	13399
TPS memory leaks which could cause TPS UI freeze	13671
Daily QA interface does not adequately indicate Collimator move is in progress	13782
Main wheel UI not disabled/hidden while importing is not done	13799
Double message boxes were shown when aborting or ending a treatment	13806
Beam progress bar on the wheel is not matched with index mark when beam nodes a skipped	13846
Missing MV images and analysis report on Steel Ball	13852
Transitional alignment used two images that were less than 30 degrees apart	13919
Interrupted multi-image tracking is not completed	13956
Constraint points are not displayed sometimes or are rendered too slowly	14064
Proximity message not displayed in the larger message wheel	14149
Three images are taken during transitional alignment	14210
Font size used messages is too small	14401
Make-up fraction message is confusing	14403
Confusing (or no) message when plan failed to load due to gantry out of home node	14405
Simulate by Rx Centroid fails	14466
DVH plot does not show up on report	15245
Broker web UI/ interface reporting not accurate	15311



Title	ID
Incorrect delivery start time in report for a plan with make-up fraction	15642
Beam on too long error	15708
Error message for planning on targets without a defined contour	15713
Radiation Time Management: Plan Name is not stored for kV if treatment is interrupted	15714
Collimator size not showing on Radiation Time Report	15742
Estimated time of plan delivery 15-18 minutes overestimated	15791
Canceling Optimization results in Warning sign "Verify Isocenter Path"	17338
Unable to clear Error from UI	17378
Treatment type is incorrect in System Report	17457
Last node of previous isocenter may be in a potential collision zone	17528
Auto path issues during inverse planning	17549
Self-check MV image NaN results are "Passing"	17915
Number of Beams Changes Significantly for 1 mm Isocenter Shift	17971
Email user settings and password	18005
Shell does not open using the Extract button on the E-Stop wheel	18061
E-Stop took a long time to clear	18066
Shell does not close using the Close both button in Daily QA tab	18081
Self-check Failure errors	18184
Differences between XYZ Edge and 6D Solver	18204
Treatment View application closed unexpectedly	18634
Error "Watchdog timeout (Primary Dosimeter)" during treatment	18902



Title	ID
Inconsistent dose statistics reported in treatment plan	18951

SW Component	Version
Treatment Planning Software	1.8.57.11300
Treatment Delivery Software	1.8.54.18733
Broker	1.8.20.1668
Agent	2.0.20-25
Installer	20220708.1



3. Known Issues and Workarounds

3.1. Treatment Planning System

- **Automatic subvolume fusion fails when whole head is not in secondary dataset (13443)**
For large datasets, automatic subvolume fusion fails when whole head is not in the secondary dataset. The workaround is to perform manual subvolume fusion.
- **CT segmentation fails when multiple series are approved sequentially in a short time (13809)**
If multiple CT series are uploaded to the database computer in a short time, only the first CT will be segmented successfully. To avoid this issue, wait a few minutes between importing additional CT series.
- **Select Isocenter from List of Isocenters (14109)**
If you wish to select an isocenter from the list of isocenters, click on the magnifying glass icon to select an isocenter from the list of isocenters in TPS.
- **Wheel loses focus during tab navigation (15704)**
When going from rectangular to circular dialogs, the focus on icons in the wheel may be lost preventing tab navigation. To re-enable tab navigation, use the mouse to click on an icon, then continue tab navigation.
- **Color selection pop-up persists after selecting a color (17194)**
After selecting a color for a contour there may be times that the color selection grid remains on the screen. To close it, click outside the color selection grid
- **Tracking Contour not created when contour limit is reached (17927)**
If a plan has 32 contours excluding the Tracking Contour, TPS will display a message that it is unable to retrieve the Tracking Contour if one is requested during Plan Approval. If this issue occurs, delete an unused contour, and approve the plan again.
- **Incorrect dose statistics if structure is outside the dose volume (17947)**
The dose statistics are not computed for a structure that is drawn on the most inferior or superior slice of the CT. If this issue occurs, contact ZAP support.
- **Treatment paths in Simulation Plan using Rx Centroid cannot always be verified (17965)**
The planning system will display a warning if the treatment path for a Simulation Plan using Rx Centroid cannot be verified when the path from the original plan has nodes in potential collision zones for the simulation.
- **Estimated Treatment Time is different for same patient plan between two TPS stations (18100)**



The delivery time estimate between two TPS stations may be slightly different for the same patient.

- **Interpolation issue using Lines/Polygon (18463)**
The user might see an unexpected 3D shape when drawing a rectangular prism with the Lines/Polygon tool. The cause of this problem is that vertices of a polygon on one slice occasionally do not map to the corresponding vertices on another slice leading to wrong interpolation between slices. The workaround is to skip fewer slices in between or use copy-paste on new slice if appropriate.
- **"Accept Image Update" message when attempting to create a simulation plan (18532)**
Occasionally, when attempting to create a simulation plan, despite not changing the image studies, the user might receive a message from the TPS: "Accept Image Update. Plans that use this image will be removed. Continue?" The workaround is to press "Cancel" and retry.
- **Issue with merging plans (18674)**
When merging plans with Tracking Contours the merged plan will have two Tracking Contours. When this issue occurs delete both Tracking Contours. Then during Plan Approval, when TPS asks if you would like to add a Tracking Contour, select Yes, and review the contour added.
- **Failure to calculate dose statistics (18951)**
In rare instances TPS fails to calculate the dose statistics. If this issue occurs the system will reset the prescription and report error "Cannot set prescription in the plan". The workaround for this issue is to re-prescribe the plan.
- **Treatment Planning Report contains dose for Body (19552)**
The Treatment Planning Report contains a line with the dose statistics of the Tracking Contour (Body). The values are meaningless and can be ignored.

3.2. Treatment Delivery System

- **Failed Self-Check (13326)**
If self-check fails, follow the steps below:
 - (1) Make sure there is nothing on the table.
 - (2) Make sure HV Enable key is turned to Enable.
 - (3) Make sure the table cushion is correctly positioned.
 - (4) Check for other obstacles in or around the system.
 - (5) Power down the system and power it up again.

If there is still an issue after following these steps, call ZAP Customer Service for additional support.



- **Table calibration error during initialization (4623)**
Occasionally, the initialization fails with a Table calibration error. If this occurs manually push in or pull out the table about halfway and repeat initialization.
- **MV exit dose conflicts with prediction (5650)**
In some cases the exit beam attenuation is not calculated accurately due to the beam traversing anatomy or machine components that are out of the field of view of the CT. This can result in an error indicating that the MV imager data conflicts with the calculated value. Referencing the MV dosimeter graph can confirm if the problem is from a few miscalculated beams or a broader problem with the dosimetry. To continue with treatment, temporarily turn off the dose check by right clicking on the overlay image in the delivery view and uncheck 'enable' in the context menu.
- **Dosimeter calibration factors in QA page not saved automatically (9657)**
The dosimeter calibration factors in QA page need to be saved manually to take effect.
- **Door and shell hesitate while opening/closing (12460)**
In rare cases, when the operator presses the extract button in the Treatment View application, the door and shell start, stop and start opening several times. The solution is to click the extract button three times or to restart the Pendant application. To restart the Pendant application, swipe right from the left edge of the Pendant screen and click on the X to close the application. After the application is closed, double click on the Pendant application icon.
- **TDCS does not always restart after terminating Treatment View mid-treatment and then restarting (12559)**
When the Treatment View application is restarted after losing response or being accidentally closed, in rare cases, the Treatment Delivery Control Service is not started automatically. The workaround in the error state is to exit the Treatment View application, wait at least 30 seconds and then restart it.
- **No automatic re-routing for Transitional Alignment and Multi-Image Tracking (13102, 19146)**
The system will not automatically search for a new path if it detects a potential collision during inter-isocenter or multi-image alignment. If a potential collision is detected during this portion of a treatment, the user should manually initiate an auto-align.
In rare instances, after auto-align completes, Multi-Image Tracking resumes. In this case the system may encounter the same proximity error and cannot complete. The workaround for this issue is to end delivery and deliver a make-up fraction.
- **Plan loading issues (13606 and 13874)**
If a plan fails to load the following steps can be taken:



- (1) Verify that the plan is not open on the Treatment Planning System. If it is, close it and select the plan again.
 - (2) Log out and log back into the software
- **Issues with MV detector graph (17574, 17575)**
If the first node of a path is a via node, the indexes on the MV detector graph are shifted by 1. Nodes and their colors in the path map do not always correlate with MV detector graph.
 - **Unsuccessful beam record submission (17957)**
In rare instances the system is unable to submit the beam recording and reports and reports an "Unsuccessful beam record submission. Please refresh patient plans." error message. Contact ZAP Customer Service if this issue occurs.
 - **Node value sometimes not shown (17995)**
Occasionally, the node value in the delivery wheel is not updated.
 - **Frozen camera after software closed unexpectedly (17998, 18130)**
In rare instances after the delivery software closed unexpectedly the cameras are frozen. Following a software crash check the cameras before proceeding with the treatment.
 - **Errors automatically cleared by the hardware subsystem cannot be cleared from the TDS UI (18662)**
If the system encounters an error that is resolved without user intervention, the system might be in an E-Stop state that cannot be cleared in Treatment View. To proceed, manually trigger an E-Stop and clear it.
 - **Repeated "TDCS received error signal from KV generator" error messages (18692)**
Restart Treatment View if the system does not take kV images and reports "TDCS received error signal from KV generator" repeatedly during auto-align.
 - **Artifacts in kV images during treatment (18916)**
Manually repeat alignment, by either triggering an E-Stop and wait for the imaging interval to pass or go back to auto-align if the user notices a kV image artifact during treatment.
 - **Treatment Delivery Report contains dose for Body (19552)**
The Treatment Delivery Report contains a line with the dose statistics of the Tracking Contour (Body). The values are meaningless and can be ignored.