



Customer Release Notes for DP-1006 CRN-0149

This document describes the following:

- ZAP-X® system software content that is new with the DP-1006 release.
- Changes to ZAP-X® system software since the prior release (DP-1005).
- Known issues and workarounds.

1. Compatibility

ZAP-X® software is a set of major software components. These release notes are for the following version:

- Treatment Planning Software: v1.8.56.
- Treatment Delivery Software: v1.8.53.
- Treatment Delivery Control Service Software: v1.8.53.
- System Database Software: v1.8.19.

2. Content of DP-1006

The most recent release of ZAP-X® software is the DP-1006 release. It contains the following:

2.1. DP-1006 Features

Treatment Delivery includes the following features:

- **Path detour**
 - The ability of the system to respond when the patient or another object interferes with system movement was enhanced. If a proximity error is encountered the system will attempt to move forward with reduced buffer size and speed. If this results in a second proximity error, the system will use alternative routes to the next beam. If no safe routes can be found the system will skip the beam and find a route to the next beam. While traveling on the detour the system will move at reduced speed.
- **Matching beam order between planning and delivery**
 - TDS will deliver beams in the order shown in the Treatment Planning Report.



- **Display secondary dosimeter reading**
 - In addition to the primary dose (MU) and dose rate (MU/min), the Treatment UI displays the secondary dose and dose rate on the top of the MV image and when hovering over the corresponding fields on the Beam Progress Wheel during delivery.
- **Reject automatic alignment results**
 - Added ability for the user to reject auto-align results.

Treatment Planning includes the following features:

- **Automatic path optimization improvements**
 - Reduced automatic path calculation time
 - Gantry travel nodes, where the gantries will change direction, but no beam will be delivered, were introduced to improve path finding. Travel nodes are displayed in gray in the path progress chart.
 - Gantry will revisit nodes if this improves the delivery path
 - More efficient paths are chosen that result in less back-tracking in a single isocenter.
- **Define number of constraint points to use for Inverse Planner**
 - If the Inverse Planner failed to find a solution for a large problem, user can now break it down to a reasonable size and have the Inverse Planner find a solution for this new size

2.2. DP-1006 bug fixes

DP-1006 contains fixes for the following issues observed in the field:

Title	ID
Gantry node appeared outside of the path control	6508
TreatmentView did not record entire delivered dose from TDCS when beam was aborted	8981
TDS Optimized paths inefficient	9656
Inverse planner fails to find a solution for large problem	10071
MV imager timed out	10284
Inverse planning hangs for plan with complicated critical structures	11663
Proximity error associated with TDS shortcut	11763
Proximity error with no detour	12166
No option to reject auto alignment	12339
Zoom ratio is not the same on all the views and blue lines are not aligned across the views	12348
An unnecessary KV image is taken when there is only one beam node in the path	12480
Noticeable delay (~2min) between end of auto alignment and alignment review	12504
Five second image interval is disabled in Treatment View	12556
TDCS closed unexpectedly during a treatment due bad MV image	12591



Title	ID
TDS should NOT allow user (e.g. therapist) without PlanDesign permission to start the treatment	12604
Partial KV image acquired	12644
Archiving patients does not improve patient loading performance	12663
KV Detector Saturation	12671
Therapist is missing permission to PlanChangeRequest	12676
TDCS gantry initialization fails if GantryOriginSD.xml file is missing	12790
kV technique was set to 75, 100, 100	12793
Gantry velocity reporting errors due to large movements	12797
Transitional Alignment not as expected	12822
Manual Correlate Button Does Not Clear Image History	12873
Inverse Planning Voi Beam Toggle Switch Has Wrong Visual States	12915
Shell (rings at certain distance) constraints within Inverse Planning don't work	12916
Self Check KV image comparison fails with mismatched images	12922
TextBox clear button's icon not showing properly	12926
Inverse Planning - Plan doesn't restore constraints and dose after auto restore	12948
Tracking re-imaged at same node due to lack of rounding	12949
Too long plan name does not prompt with error in TPS	12951
TPS UI froze	12953
Segmentation fails when raw pixel values are large	12993
Missing fraction delivery time information on Delivery Report	13074
Inconsistent behavior when selecting Left mouse button and Drag mouse movement, in text box -Plan Summary	13115
Advanced Correlate Function Does Not Clear Image History	13158
TPS Application interrupts after a read only plan is open from search bar	13174
KV images and DRR do not display during beam delivery	13175
Fusion is timing out with high-resolution t2 MR	13183
LpSolve causes a "CallbackOnCollectedDelegate" exception sometimes	13184
import or export feature in fuse wheel navigates to Main UI	13199
Segmentation instance number is not matching slice location	13221
Image import failure of segmented CT data	13298
Contour outline not visible on non-axial views	13334
Manual subvolume fusion fails	13339
Daily QA - Treatment view shows beam off when beam is on	13425
Initial auto subvolume autofuse result presented for different user-indicated fusion	13442
Number of auto-alignment images was NOT included in report	13522
DVH values not always visible	14102
TPS - error message when selecting MUs	14259
Dose conflict error	14646



2.3. CRN-0149 bug fixes

CRN-0149 contains fixes for the following issues observed in the field:

Title	ID
Stale delivery instructions saved with plan after optimization parameters changed	15334

3. Known issues and workarounds

- **Failed Self-Check (13326):**

If self-check fails, follow the steps below:

- Make sure there is nothing on the table.
- Make sure the table cushion is correctly positioned.
- Check for other obstacles in or around the system.
- Power down the system and power it up again.

If there is still an issue after following these steps, call Zap service for additional support.

- **MV exit dose conflicts with prediction (5650)**

Occasionally, the exit beam attenuation is not calculated accurately based on the CT information. This can result in an error when the MV imager provides data that 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, 12988)**

When the operator presses the extract button in the Treatment View application, sporadically, the door and shell start opening and then stop several times. The solution is to click the extract button three times or to restart the Pendant application.

- **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 and restart it.

- **No automatic re-routing for inter-isocenter alignment (13102)**

The system will not automatically search for a new path if it detects a potential



collision zone during inter-isocenter alignment. The workaround is to manually initiate an automatic alignment.

- **kV images not re-submitted if database computer goes offline during delivery (13194)**
In the unlikely scenario where communication between database and console computer is interrupted during treatment, beam data and delivery times are uploaded to the database when the connection is restored. If this interruption occurs, the kV images are available on the console computer but are not transferred to the database computer. Contact Zap service to retrieve them.
- **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.
- **Selected a locked plan and received "Object Reference not set on an instance of an object" (13606)**
The system will report the error "Object Reference not set on an instance of an object" if a locked plan is selected in the treatment plan selection screen. Unlock the plan to deliver it.
- **Daily QA interface does not adequately indicate collimator move is in progress (13782)**
When the collimator size is changed or the user selects "Configure" in the Daily QA: Dose tab, the dropdown menu changes to "None", but the system does not indicate that the collimator is moving to a new position. The move takes approximately eight seconds and any additional collimator move commands issued by the user during this time will be queued. Depending on the number of move commands issued it will appear to the user that the collimator change takes a long time or fails. To avoid this issue, wait at least eight seconds after initiating a collimator change command.
- **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 CT series.
- **Missing MV images and analysis report on Steel Ball (13852)**
In rare instances, MV images are not displayed during Steel Ball on the Daily QA screen. Power cycle the ZAP-X system if this issue occurs.
- **Isocenters must be re-created after head center change (13864)**
If the head center is changed in TPS, all placed isocenters must be re-created by the user to avoid potentially creating a path with undeliverable nodes. Zap recommends setting and confirming the head center placement before creating isocenters.



- **Plan load failure (13874)**
Sporadically, the treatment system reports a plan load failure after powering up. Logout and re-login with the current user to proceed.
- **Gantries move off path during delivery (13387, 13491)**
Several situations can cause the gantries to depart from the displayed path. After a proximity error, the gantries leave the displayed path when trying to find a detour around the obstacle. When automatic alignment is used the route from the position at the end of automatic alignment to the first beam of the next isocenter may not be shown on the path display.
- **Old overlay image displayed after automatic alignment (13968)**
Occasionally, the system displays old overlay images in the treatment screen after an automatic alignment that had to be performed in the middle of a treatment. If this issue occurs the table is at the correct treatment position as determined by the automatic alignment, however the UI is not updated accordingly.
- **Extract Button Unresponsive after E-Stop (14469)**
Occasionally, the patient extract button is unresponsive after an E-Stop. If this issue occurs wait 30 seconds before pressing the extract button in Treatment View or use the vertical door bypass valve on the side of the patient entry ring to open the door.
- **Select Isocenter from List of Isocenters (14109)**
Use the magnifying glass icon to select an isocenter from the list of isocenters in TPS.
- **Fraction partially delivered message displayed (15253)**
Systems with the newer version of the Linac Beam Control Board (LBCB) may display this message at the end of some treatment fractions. The newer version of the board terminates the treatment beam slightly early resulting in the total beam delivered for each isocenter being 0.3-0.4 MU less than planned. If the total delivered dose is less than fraction's planned dose by more than 1 MU this message is displayed at the end of the fraction without a make-up fraction generated. Please note that in cases where some beams were wholly or partially skipped for any reason, a make-up fraction is generated as expected.