ZAP-X®

Customer Release Notes for DP-1005

This document describes the following:

- ZAP-X® system software content that is new with the DP-1005 release.

- Changes to ZAP-X® system software since the prior release (DP-1004).

- 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: v1.8.55.

- Treatment Delivery Software: v1.8.52.

- Treatment Delivery Control Service Software: v1.8.52.

- System Database Software: v1.8.18.

2. Content of DP-1005

The most recent release of ZAP-X® software is the DP-1005 release. It contains the following:

2.1.   DP-1005 Features

Treatment Delivery includes the following features:
- **New Align Workflow**:
    - During auto alignment there are now images taken at 3 angles instead of the previous 2. After these are acquired the system will take a short time to optimize orientation in 6 dimensions.
    - Two of those angles are displayed after alignment. You can switch which two of the three angles are displayed at any time.
    - There are new tools to evaluate the displayed alignment results. These replace the previous right-click menus and advanced tools.
    - Please see chapter 7 of the user manual for details.
- **Segmented display of DRR**
    - During alignment and delivery, the CT images are displayed with the headrest and table removed.

- **New default KV technique**
  - o KV images taken during treatment have new default parameters.
- **Secondary MU display**
  - o The secondary MU value is displayed on the MV image.
- **Simplified right-click menus**
  - o During delivery the MV image has a single right-click option to disable the dose check.

Treatment Planning includes the following features:
- **Exclude Beams from critical structures**:
  - o Inverse planning now has an option to disable all beams that go through a selected contour such as a critical structure. Please see section 6.4 of the TPS manual for details.
- **Constrain all beams to equal weight**
  - o The planning system can be configured to utilize equal weights for all beams.
- **Smoother plan loading**
  - o Loading a plan is smoother and faster with the new release.
- **Multiple Windows accounts**
  - o The TPS computer can now support multiple Windows accounts with different permissions. Note, this is different than multiple TPS accounts, which has always been supported.
- **Extension of CT density table**
  - o The Treatment Planning System uses electron density for inhomogeneity correction. The conversion from CT units to electron density is performed according to the table below. New in this release is the addition of the Titanium entry.

Material	CT Value (HU)	Relative Electron Density
Air	7	0.001
PMP	804	0.853
LDPE	896	0.945
Polystyrene	953	0.998
Water	1000	1.000
Acrylic	1115	1.147
Delrin	1366	1.363
Teflon	2001	1.868
Titanium	10338	3.735

2.2. DP-1005 bug fixes

DP-1005 contains fixes for the following issues observed in the field:

Title	ID
L value is cut off in the table tray on the bottom of the treatment view - FPT	3379

Title	ID
[LBCB] Allow dosimeter monitoring from the linac app.	4182
TPS App Strings and Tool Tips Discrepancies; inconsistencies between TPS Manual, and TPS App	4901
Localization: Some strings in Report aren't localized	9458
Localization: Some strings in Commissioning page are out of bounds and some are missing localization	9540
Confusing message displayed when trying to approve the commissioning data	10222
Critical Structure is deleted, the approve icon did not get greyed out	10632
Localization - German: STOP string is not displayed in Daily QA Workflow	11511
Localization - German: Strings that are not translated	11521
Plan cannot load because of pixel spacing inconsistency between plan file and DV file	11542
The approver Name is not anonymous in planreport.json	11543
Localization: TPS date names are not localized	11546
System defaults to LCB instead of LBCB	11549
Localization - German: string in search sidebar window, title is not localized	11550
Missing translation Italian in Fusion "Initial Match", "final Match" and "Fuse images"	11551
Localization - German: Disk Space and System Memory values are not localized	11559
Localization - German: Export Anonymized<Patient> is truncated.	11573
Localization - German: Tool tip text for Ruler is truncated	11576
Approve icon is available after Mu is imported	11583
Localization - German: Plan Summary Report, months are partially localized	11587
Commissioning data is not overwritten but the plan status is changing	11592
Missing Translation: "TPS will only load plan properties that are not dependent on this data in Read-Only mode. This plan cannot be saved under a new name."	11615
Self Check: KV image comparison failure reports "Failed MV image comparison"	11653
New Conformity Index (nCI) is less than 1	11724
Incorrect error message when new system fingerprint required	11756
The Path Library generation notification shows up at TPS login	11758
TDCS process exits immediately after launch	11831
Localization (German): Nein Aktiv Isozentrum	11919
TreatmentView unable to connect to TDCS	11923
Discrepancies between collision on S1 and pathchecker	11977
Imaging loop during treatment	12158
Gantry Motion Timeout during move for correlation at start of next isocenter	12212
Table calibration fails when the table yaw is not at center. (yaw is inclined in one direction)	12223
Mini Alignment triggered after alignment & 1st image <20 deg	12257

Title	ID
Decimal beam number on plan selection page	12268
CameraRegistrationApp hangs on S1's Console PC	12271
System time change	12290
Pendant lost current time	12318
Localization Missing Strings in Generated report	12331
Gantry Motion Timeout during mini-alignment is too short	12500
TreatmentView couldn't submit offline beam record generated from last session	12529
Commissioning screen shows CT number 600	12554

3. Previous releases

The DP-1005 contents include features and bug fixes that may have been installed previously on your system but were not considered part of a full-field release. Please contact your Zap representative if you are unsure if your system already had this content

3.1.   Features

- The rotating 3D skull display has been replaced by a picture of the system.

3.2.   Bug Fixes

Title	ID
Swap KV/DRR overlay image with MV image view in delivery page	11646
Auto Alignment review page	11665
Change ImageOverlay singleton to a stateless image converter	11666
Add ImagingModel implementation to cache KV/DRR overlaid images for ViewModel	11667
Unsubscribe ImageDisplay.Instance.EventDetectorIma geAcquired event when view goes out of scope	11702
Add new image manipulation tools to all image display pages	11709
Show axial-alignment hint if auto- alignment is performed again	11712
Add ability to adjust window/level for DRR and KV images during auto alignment review	11716
Add thread-safety to acquired image cache	11718
Overlay image missing in steel ball procedure	11723
Update image processing to no longer use windowed images for Blend and Subtract	11731
Make crosshair stationary and centered by default.	11732
Add mouse interaction to change window/leveling in auto alignment page	11733
Add ability to reset zoom, pan and window leveling	11735

Title	ID
Modify color channel weights for overlay blend function.	11736
UI change to wheel	11740
Add mouse idle distance behavior to alignment control.	11742
Remove zoom and pan functionality on images in auto-align, axial-align and delivery	11744
Magnify on the DRR doesn't reflect the mouse position once auto-align completes	11746
Add mouse interaction to change window/leveling in auto alignment page	11733
Self Check - MV Mean Percentage error remains 0 on failure	11747
Alignment review - Blend mode image display	11748

4. Known issues and workarounds

- **Image rendering not optimal (12334)**
  With the new release, CT images will have the headrest removed. However, the headrest will be displayed for CT series that had been imported prior to upgrade. The display may not be optimized for these images. This issue will go away as new CT series are imported.

- **Failed Self-Check (4613, 4989):**
  If self-check fails, follow the following steps:
    o Make sure there is nothing on the table.
    o Make sure the table cushion is correctly positioned.
    o Check for other obstacles in or around the system.
    o Power down the system and power it back 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, turn off the dose check by right clicking on the overlay image in the delivery view and uncheck 'enable' in the context menu.

- **Patient extract from Operator Console inoperable after E-stop (7683):**
  Use the pendant to extract the patient, if patient extract from the Operator Console is inoperable after an E-stop was triggered.

- **Final beam may not be fully recorded when a treatment is aborted (8981)**
  When a treatment is aborted partially through a beam the final beam record may be off by several MU. Note the actual beam delivered and compare that to what is in the report. Adjust the make-up fraction as needed.

- **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.

- **Cameras were not showing images (10155)**
  In rare cases the image panels on the right-hand monitor are blank after booting. Restart the Treatment View application to view the image panels.

- **MV Imager measurement timed out during treatment (10284)**
  Occasionally, the beam does not trigger the MV imager to start recording. This results in a time out error that can be cleared to continue treatment. Unless this happens repeatedly, there is no concern about the accuracy of the treatment.

- **Shell hesitates while opening/closing (12460)**
  When the operator presses the extract button in the Treatment View application, sporadically, the shell starts opening and then stops several times. The solution is to restart the Pendant application.

- **Five second image interval is disabled in Treatment View (12556)**
  The button the change the time interval between x-ray images to 5 seconds is temporarily disabled. This will be addressed in a future release.

- **TDCS doesn't always restart after terminating Treatment View mid-treatment and then restarting (12559, 12591)**
  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.

- **Therapist user has insufficient permissions for recording treatment (12604)**
  The default permissions for the therapist user group have been found to be insufficient for recording treatment reports. To avoid this issue, use the admin user group.