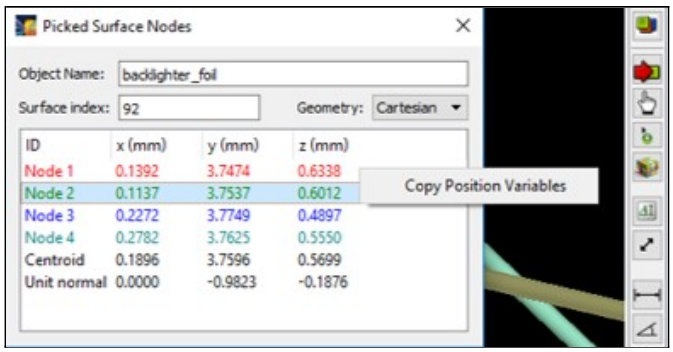
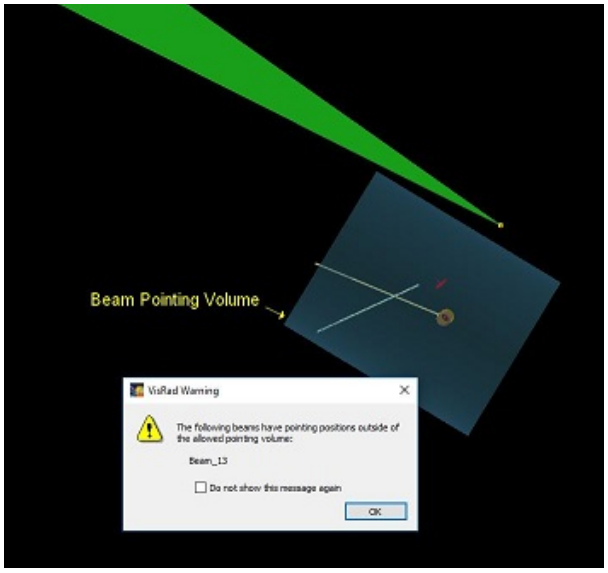
Revisions for VISRAD 16.1.0

- Several features have been added to improve manipulating the view in the *Main Graphics Window*:
  - When zooming with the mouse wheel while using *Orthographic Projection,* (*Show* | *Orthographic Projection* menu item), the zooming occurs towards or away from where the mouse is pointed. When in *Perspective Projection*, zooming with the mouse wheel behaves same as previously.
  - Space mouse support has been added. Testing has been performed using 3DConnexion space mouse. Zooming, translations, and rotations are supported. (As with zoom with the mouse wheel, when in *Orthographic Projection*, zooming occurs towards or away from where the mouse is pointed.)
  - Zooming with the mouse wheel can now be done when in *Translation* mode (tool button).
  - Clicking on a *Target Component* in the *Main Graphics Window*:
    - The *Key Points* of the component are now displayed, and the last target component picked is stored.
    - Three items have been added to the right-click menu:
      - *View Object* is used to sets the viewing position relative to the last picked *Target Component* (*e.g.*, top/bottom or front/back)
      - *Rotate About Object* is used to set the *Rotation Coordinate System* to that of the last picked *Target Component*. This is utilized by the sliders in the lower left portion of the *Main Window*.
      - *Set Viewing Position* is used to set the view position (same as the *Set* | *Viewing Position* menu item).
- In *Preferences* (*Graphics* tab), the default projection model has been changed from *Perspective* to *Orthographic*. Orthographic projection is generally better for manipulating the view in the *Main Graphics Window*.
- Picking on *Chamber Components* in the *Main Graphics Frame* is now supported.
  - Double-clicking on a *Chamber Component* brings up the *Chamber Component Parameters Dialog*.
  - Displaying node positions for picked surfaces of *Chamber Components*, using either the ( ) or ( ) tool buttons, is now supported.
- To copy position variables from the *Picked Surface Nodes* widget into other widgets with position variables, which is displayed using the ( ) tool button, users can now right-click on one of the listed nodes, and select the *Copy Position Variables* menu item. When this is done, all 3 position variables are copied, and the geometry (Cartesian, cylindrical, or spherical) is tracked. When pasting into boxes using a different geometry, the position variables are converted to that geometry.
  - Double-clicking on one of the listed nodes populates position data fields in the *Point-to-Point Distance Tool*.



- *Laser-Target Capture/Clearance Report*: When showing only non-cleared surface elements for a laser beam, the cleared surface elements can also be displayed as semi-transparent elements.
  - Parameters which set the transparency are on the *Config. Checks* tab of *Preferences*.
- *Target Positioning Viewers*: The ability to display beam spots overlay has been added. To do this, select the *Show* | *Beams Spots Overlay* menu item in the viewer. Labels for the beams are not displayed. The properties of the beam spot contours are specified in the *Beam Spots Overlay* box on the *Lasers* tab of *Preferences*.
- OMEGA Target Chamber: Checks on laser beam pointing are now performed. Beam pointing is limited to a cylindrical volume: 10 mm off-axis orthogonal to the beam direction and +9 / -15 mm along the beam propagation direction.
  - Pointing checks are performed each time laser beam and target component parameters are edited (the latter because beams can be pointed relative to target components).
  - Beam pointing checks can also be performed using the *Lasers* | *Perform Beam Pointing Checks* menu item.
  - Checks are not performed on probe beams, beams entering from EP ("Beam_EP"), or custom laser beams.
  - Warnings can be turned off either by checking the box in the warning message, or in *Preferences* on the *Warnings* tab.



- OMEGA *X-TVS/Y-TVS Viewer* :
  - The ability to export silhouette images of the beam spots overlay (*i.e.*, with a transparent background) has been added. To do this, select the *File | Export Image | 1-bit N/W Views - Beam Spots* menu item. The properties of the beam spot contours are specified in the *Beam Spots Overlay* box on the *Lasers* tab of *Preferences*. The beam spots are shown with 100% opacity.
  - When exporting 1-bit N/W views, it is now possible to adjust the color of the silhouette images of targets. The color used is specified in *Graphics* tab (*Target Positioning Viewer* box) in *Preferences*.
- *OMEGA SRF Beam Parameters:* The maximum allowed pointing radius has been increased from 10 mm to 15 mm.
- *NIF TaLIS Checks Controller*:
  - The order on the *Import Data List* tab has been changed so that the laser data is listed first.
  - Exporting results of TaLIS checks to a file is now supported. To do this, click on the *Export Results* button in the *NIF TaLIS Checks Controller*.
- ORION Target Chamber: The names of the backlighter beams have been switched. "Backlighter_1" now enters through Port 48, "Backlighter_2" through Port 36.
- In the laser power calculation, the size of the envelope considered for the beam (set in the *Advanced Beam Cone Parameters* box of the beam's *Spatial Profile* parameters tab) is now limited to a value based on the supergaussian parameter. This parameter is used in generating a grid of test rays used to compute the fraction of laser beam power is hitting the target grid.
- Bug fixes:
  - Displaying Direct Laser Power Deposited: when computing powers for *AMR Grids*, results are no longer stored in memory associated with results for the power computed for *Standard Grids*. This sometimes led to inconsistencies when displaying and utilizing the results for *Standard Grids*.
  - When displaying *Key Point* positions of *Target Components*, a bug causing the mouse cursor to be reset and the key points to disappear has been fixed.
  - Bug causing crash when exporting target components to a CAD file, in which the target component has a clipping volume whose reference coordinate system is that of a previously deleted target component, has been fixed.
  - Bug causing crash when importing data from a CAD file on Linux has been fixed.
  - Fixed bug where the *Picked Surface Node Positions* tool was not being displayed for the index = 0 surface element of *Target Components*.
  - *NIF TaLIS Checks Controller*: the problem with check boxes on the *Import Data List* has been fixed.