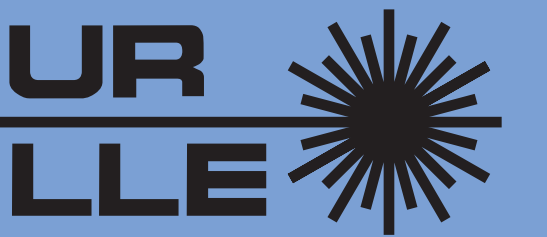


Enhanced Gas-Filled Capabilities for Ten-Inch-Manipulator-Based Target Positioners



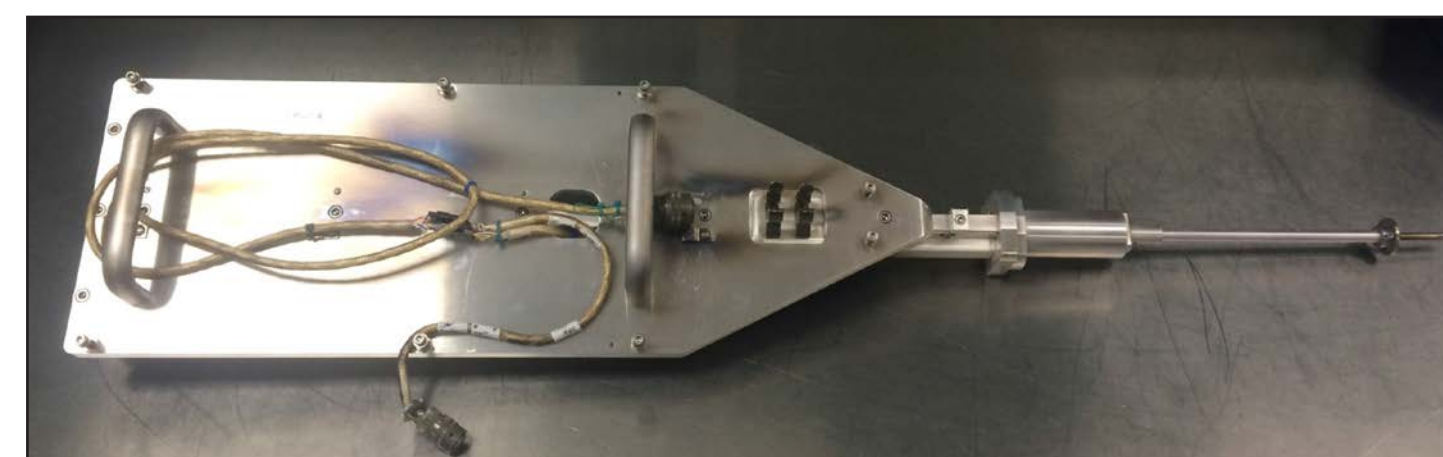
D. MASTROSIMONE, A. AGLIATA, T. BUCZEK, D. J. LONOBILE,
M. J. SHOUP III, and C. SORCE

University of Rochester, Laboratory for Laser Energetics

LLE qualified a ten-inch manipulator (TIM) target positioner (TTP) in February 2012



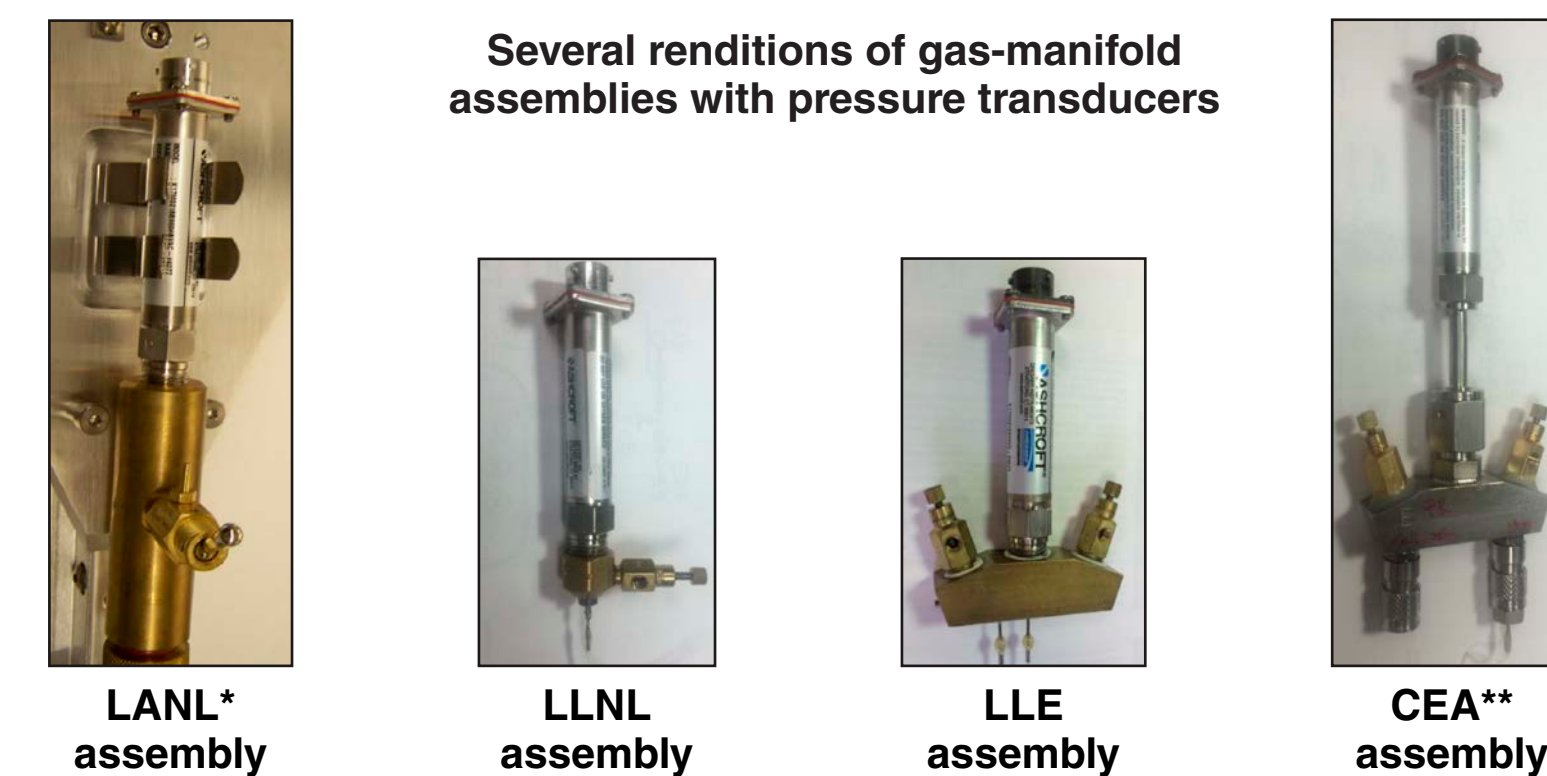
- The TIM target positioner, developed by LLE, replaced the Lawrence Livermore National Laboratory (LLNL) design that had been operational on OMEGA for over ten years
- Six units have been fabricated for OMEGA and OMEGA EP operations (three per system)



The platform has been stable; LLE now plans to standardize it on a single gas manifold/transducer (GMT).

E23910
UNIVERSITY OF ROCHESTER

OMEGA-60 has deployed many user-monitored gas-filled target assemblies



- While functional, the materials used on these assemblies were not permissible in the OMEGA EP target chamber because of contamination issues with the brass components, different adhesives used for sealing, and sticker application

*Los Alamos National Laboratory
**Commissariat à l'énergie atomique et aux énergies

E23911
UNIVERSITY OF ROCHESTER

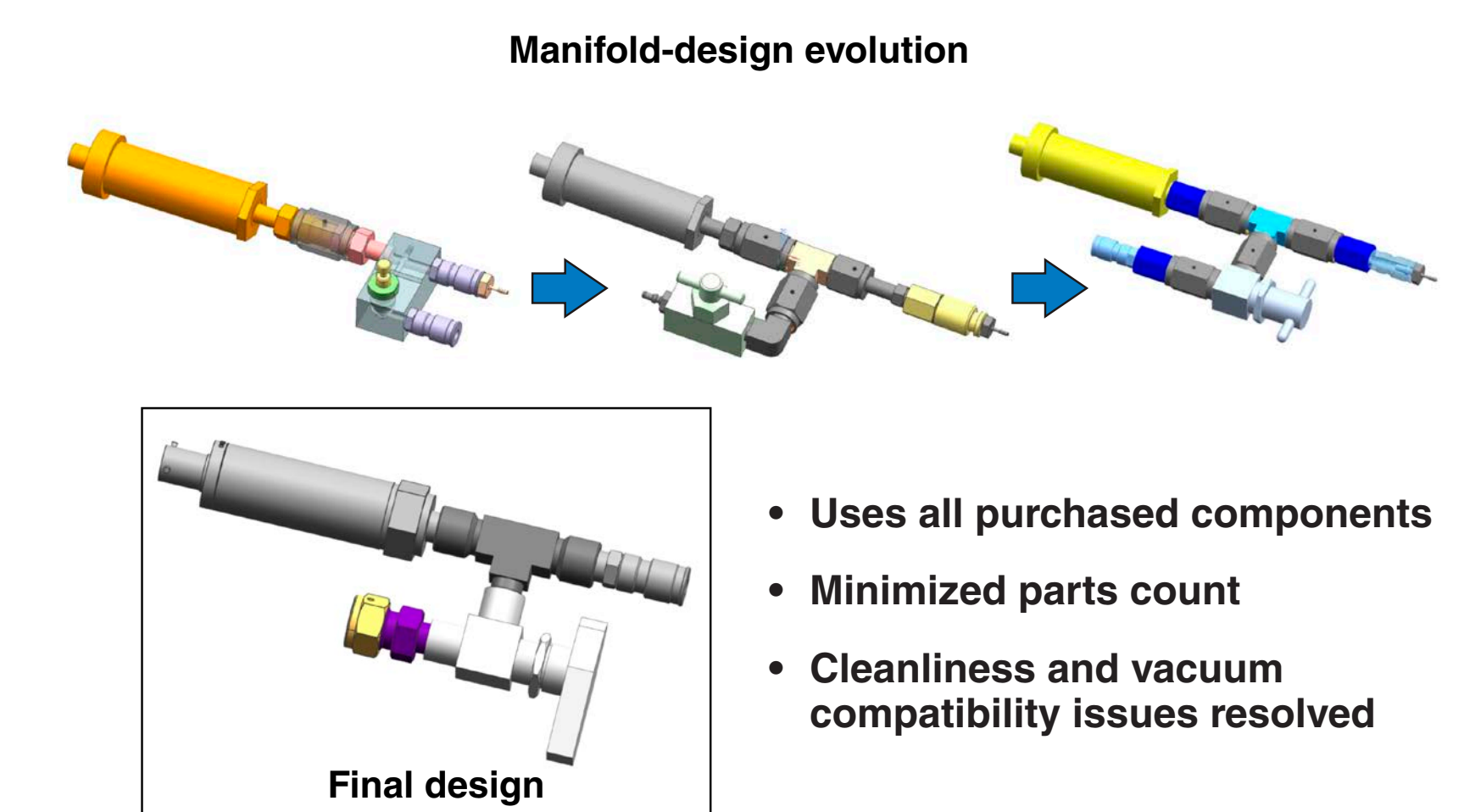
The new requirement demands for the manifold/transducer assembly have exceeded the boundaries of the existing design



Specification	Old design	Current GMT status	Goal
Maximum pressure ratings	60 psi (4 atm)	150 psi (10 atm)	300 psi (20 atm)
Pressure-monitoring accuracy	±1.0%	±0.5%	±0.05%
OMEGA EP compatible	No	Yes	Yes
Fitting sealing technique	?	Stycast #2850 (with hardener)	

E23912
UNIVERSITY OF ROCHESTER

LLE is currently in the testing phase of the new GMT design



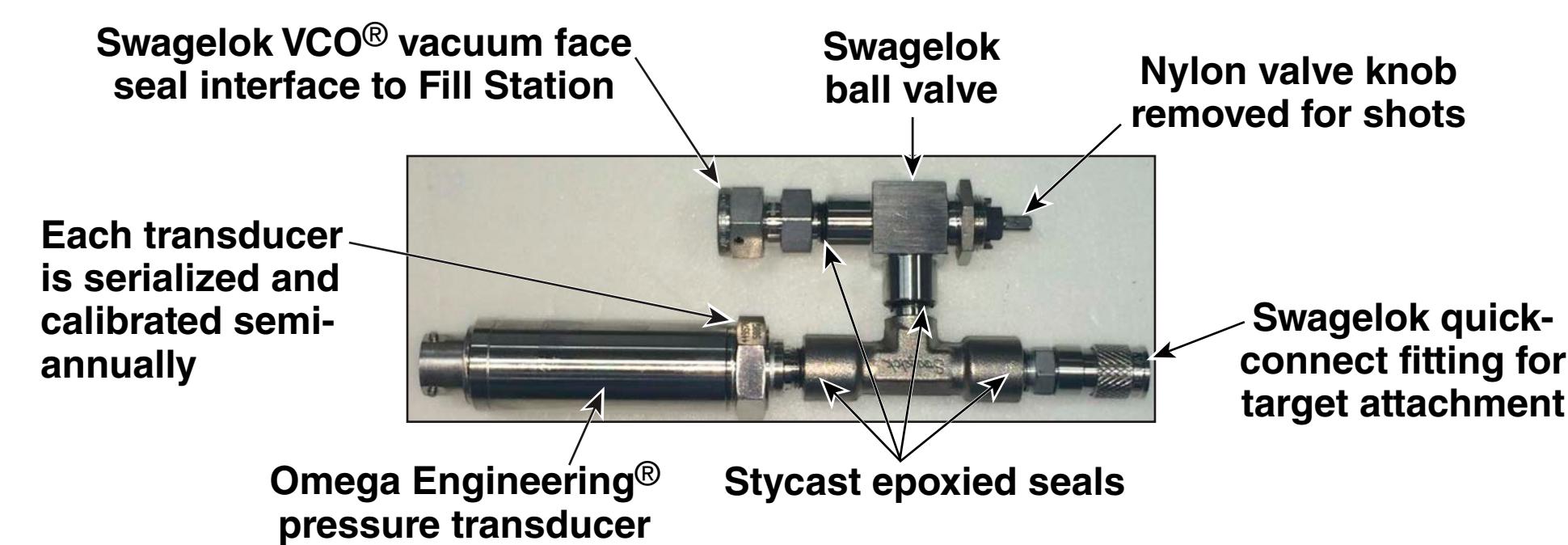
- Uses all purchased components
- Minimized parts count
- Cleanliness and vacuum compatibility issues resolved

E23913
UNIVERSITY OF ROCHESTER

LLE-supplied GMT assembly components will be provided to users



- Features
 - all stainless-steel construction fabricated
 - all components are standard “off the self”

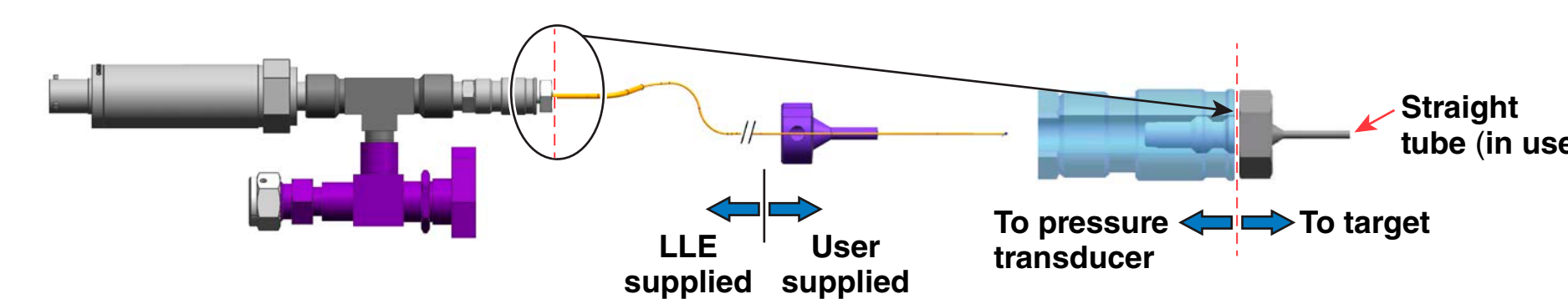


E23914
UNIVERSITY OF ROCHESTER

The target design has been simplified for collaborators by using a quick connect that eliminates the need for a dedicated GMT

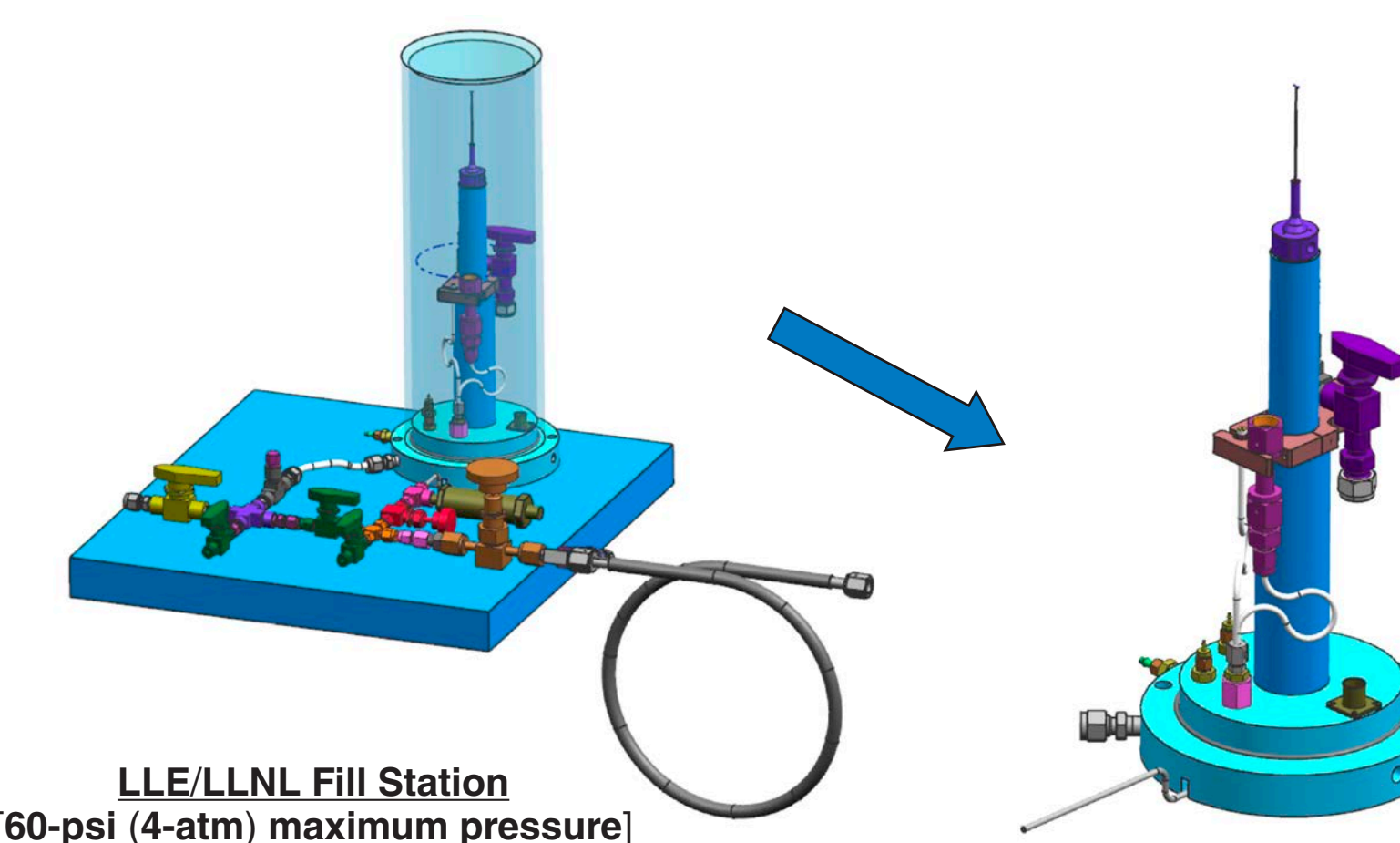


- The quick connect allows for multiple target configurations and will adapt to all Omega Facility GMT assemblies
- Targets can be fabricated and tested by the user and pressurized at LLE for shot day
- LLE is currently pursuing high-pressure tubing and adhesives that will meet pressure and vacuum compatibility goals



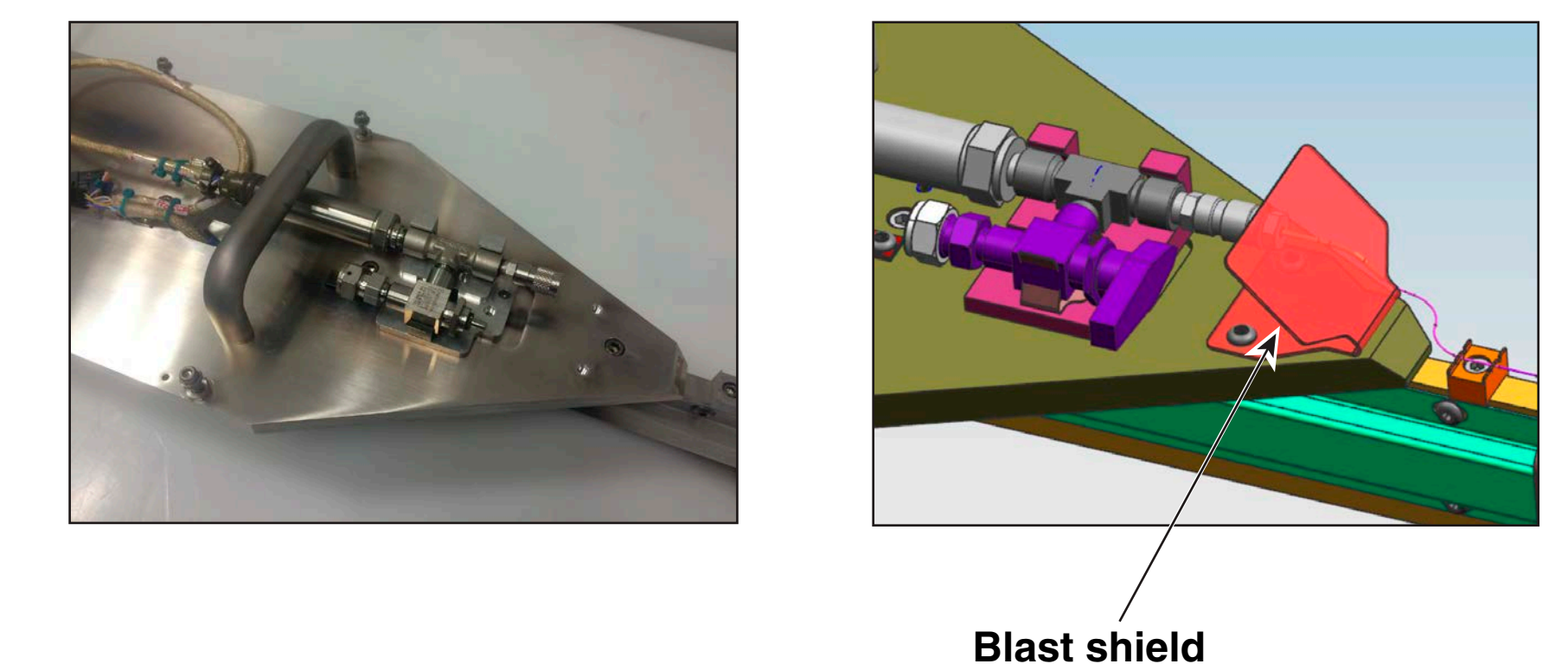
E23915
UNIVERSITY OF ROCHESTER

LLE is reviewing and upgrading the Fill Station capabilities to accommodate the higher pressure requirements and new GMT



E23916
UNIVERSITY OF ROCHESTER

TTP modifications have been made to accommodate the new GMT



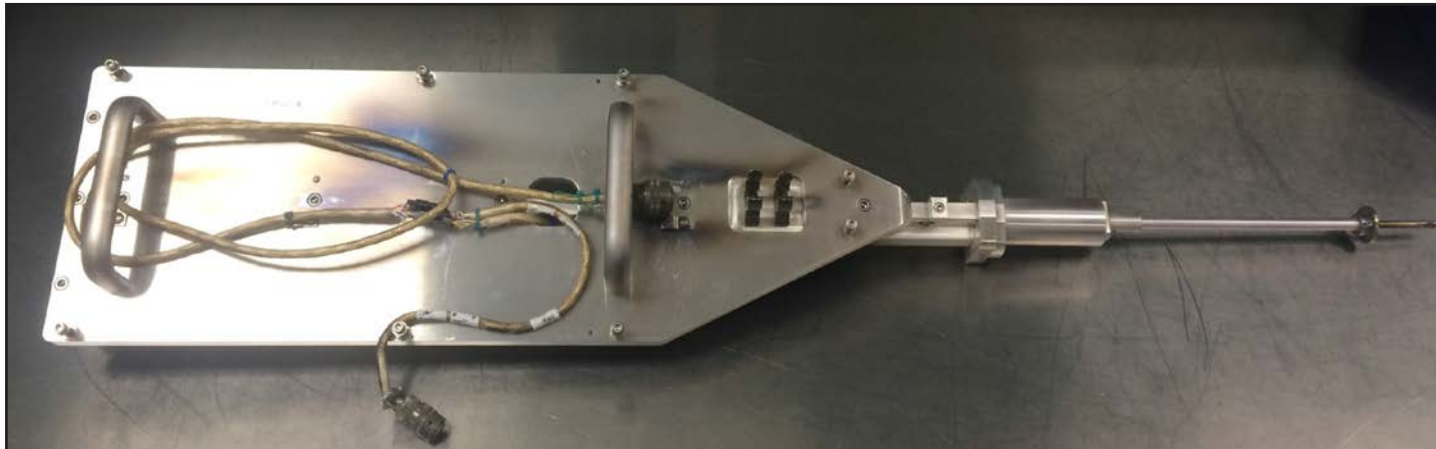
- A blast shield was added to minimize contamination of the GMT's, particularly those used in OMEGA-60

E23917
UNIVERSITY OF ROCHESTER

LLE qualified a ten-inch manipulator (TIM) target positioner (TTP) in February 2012



- The TIM target positioner, developed by LLE, replaced the Lawrence Livermore National Laboratory (LLNL) design that had been operational on OMEGA for over ten years
- Six units have been fabricated for OMEGA and OMEGA EP operations (three per system)



The platform has been stable; LLE now plans to standardize it on a single gas manifold/transducer (GMT).

OMEGA-60 has deployed many user-monitored gas-filled target assemblies

Several renditions of gas-manifold assemblies with pressure transducers



LANL*
assembly



LLNL
assembly



LLE
assembly



CEA**
assembly

- While functional, the materials used on these assemblies were not permissible in the OMEGA EP target chamber because of contamination issues with the brass components, different adhesives used for sealing, and sticker application

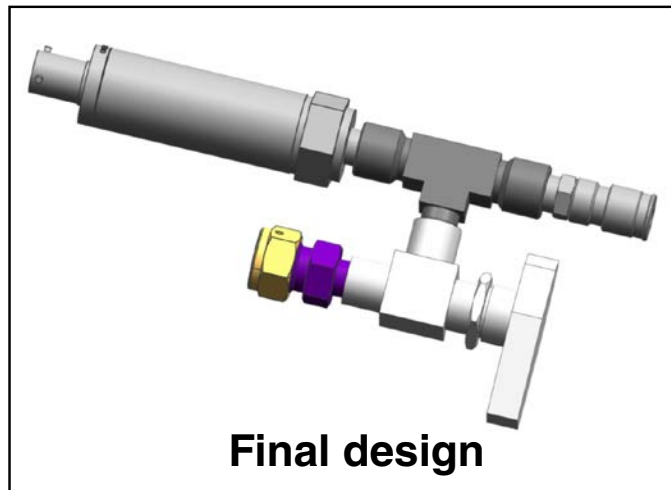
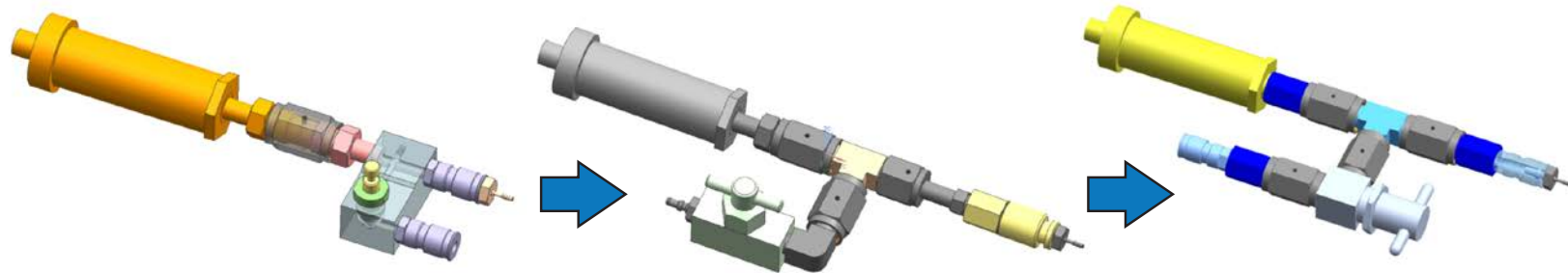
*Los Alamos National Laboratory
**Commissariat à l'énergie atomique et aux énergies

The new requirement demands for the manifold/ transducer assembly have exceeded the boundaries of the existing design

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OMEGA EP compatible	No	Yes	Yes
Fitting sealing technique	?	Stycast #2850 (with hardener)	

LLE is currently in the testing phase of the new GMT design

Manifold-design evolution

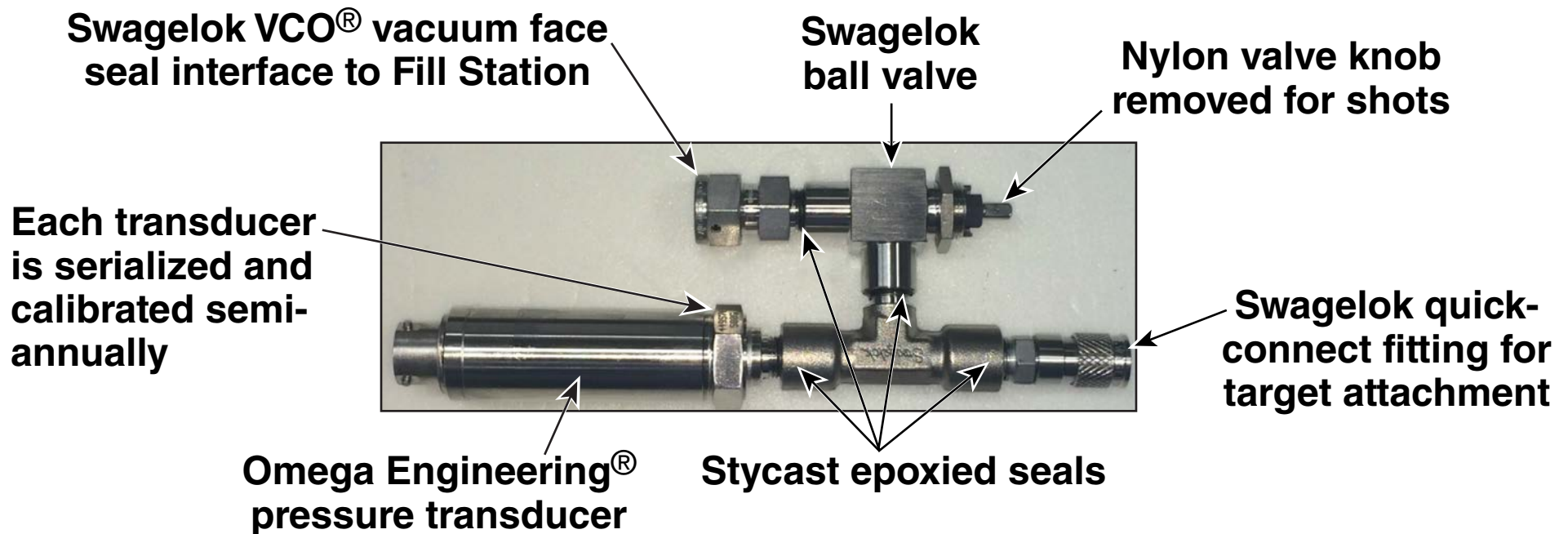


- Uses all purchased components
- Minimized parts count
- Cleanliness and vacuum compatibility issues resolved

LLE-supplied GMT assembly components will be provided to users



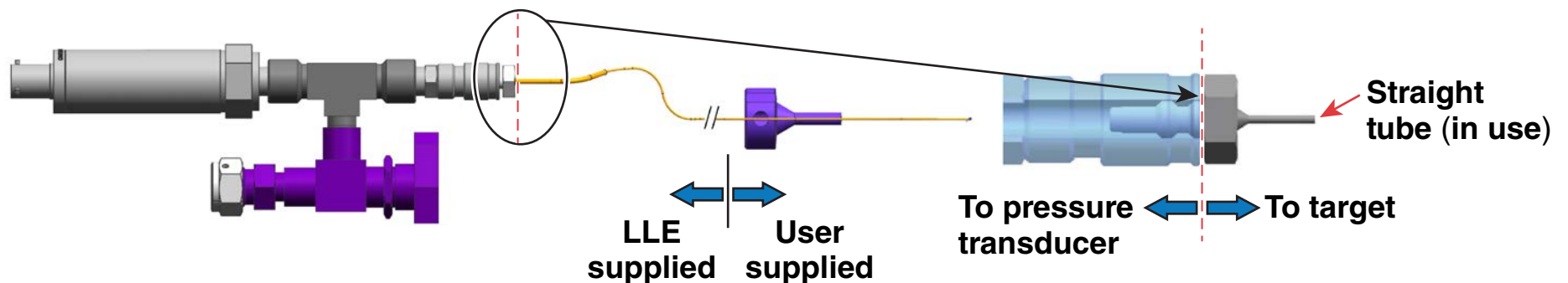
- Features
 - all stainless-steel construction fabricated
 - all components are standard “off the self”



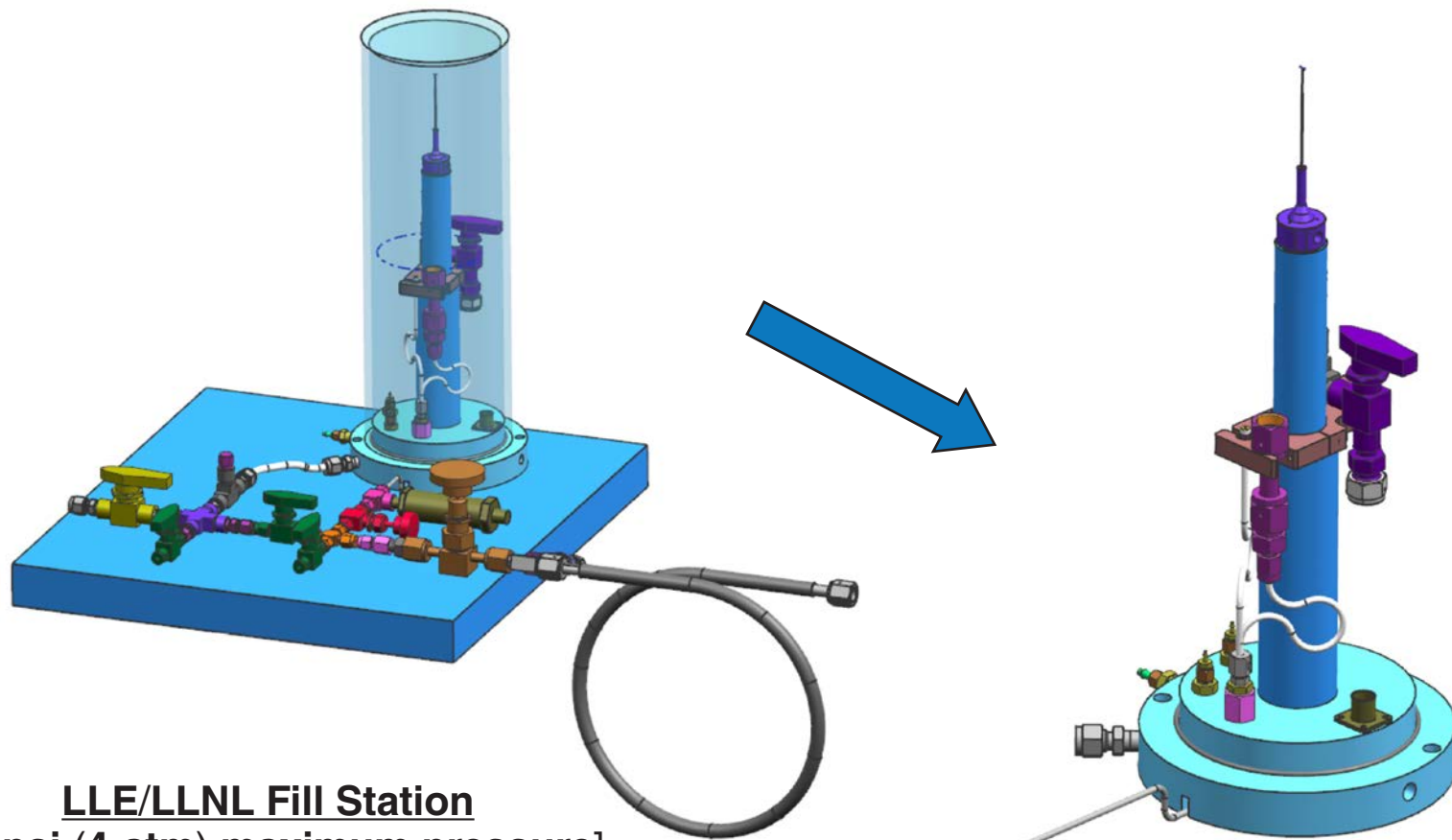
E23914

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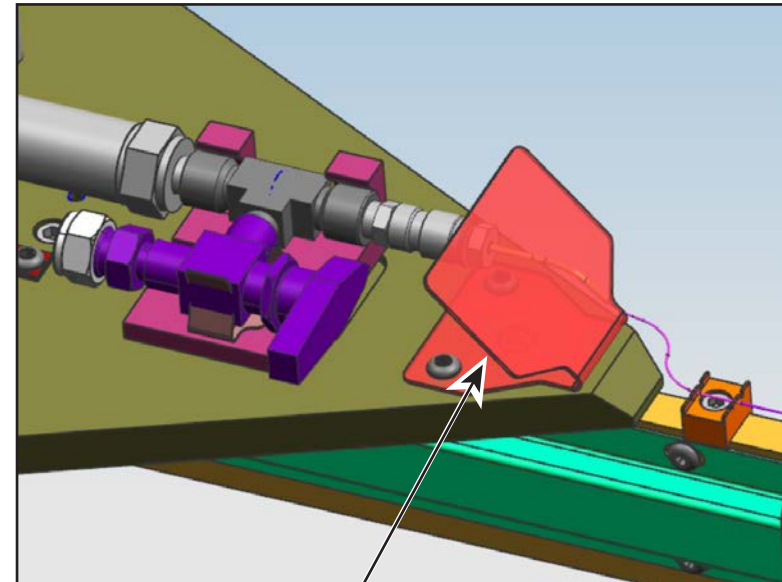
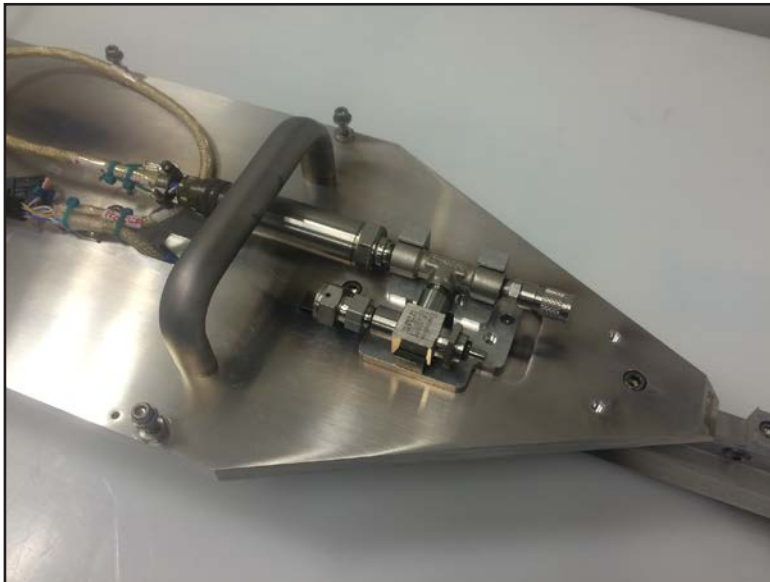


LLE is reviewing and upgrading the Fill Station capabilities to accommodate the higher pressure requirements and new GMT



LLE/LLNL Fill Station
[60-psi (4-atm) maximum pressure]

TTP modifications have been made to accommodate the new GMT



Blast shield

- A blast shield was added to minimize contamination of the GMT's, particularly those used in OMEGA-60