Purpose: AAPM TG-53 recommends certain tests for the quality assurance of treatment planning systems. We implement the recommendation in the spirit of an integrated consistency test.

Methods: Three plans (single beam, 3D conformal, and IMRT) are generated for each planning system (TPS). Plans are done on a virtual phantom, on a anonymized patient CT set, and on a CT set of the MATRIXX phantom. The MATRIXX phantom is scanned and transferred to the TPS. The three plans are transferred to the Record and Verify system (R&V) and delivered to the MATRIXX phantom. Interest point dose, profiles, PDD, planer dose, sample CT values at selected points form the baseline data. Subsequent data are generated annually or after a version change, upgrade or addition of any one of TPS, R&V, LINAC, CT and OBI. For isodose comparison gamma analysis is used.

Results: The system of RTP QA is implemented for the Elekta/CMS XiO and Varian Eclipse treatment planning systems. The Eclipse TPS was recently upgraded to Version 10. The data generated for the new version is compared to the baseline data. Interest point doses are within 0.5% and the gamma passing rates are within 0.3% using the 3%/3mm criteria between the two IMRT plans generated on version 8 and version 10 respectively. The profiles and DVHs are visually indistinguishable. When the planer doses are compared between the plan and the delivery the passing rate is within 2.8% of each other between the two versions of TPS for all three plans.

Conclusions: A method for treatment planning system QA is proposed and implemented. The subsequent results after a TPS upgrade compare well with the baseline data.