Texas A&M Cyclotron radiation effects facility
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The activity of the Radiation Effects Facility (REF) increased significantly from last year and was the second highest reported year ever. In this reporting period, the facility was used for 3,852 hours, which is a 17% increase over the low reporting hours of 2020-2021 due to the ongoing travel restrictions of the COVID-19 pandemic. Users of the facility (and hours used) over the past year were: Northrop

Table I. Radiation Effects Facility usage by commercial and government customers for this and previous reporting years.

Reporting Year	Total Hours	Commercial Hours (%)	Government Hours (%)
2021-2022	3,852	3,122 (81%)	730 (19%)
2020-2021	3,300	2,435 (74%)	865 (26%)
2019-2020	3,982	2,862 (72%)	1120 (28%)
2018-2019	3,678	2,939 (80%)	739 (20%)
2017-2018	3,681	2,622 (71%)	1,059 (29%)
2016-2017	3,355	2,501 (75%)	854 (25%)
2015-2016	3,042	2,326 (76%)	716 (24%)
2014-2015	3,024	1,975 (65%)	1,049 (35%)
2013-2014	2,399	1,517 (63%)	882 (37%)
2012-2013	2,626	1,856 (71%)	770 (29%)
2011-2012	2,673	1,630 (61%)	1,043 (39%)
2010-2011	3,042	1,922 (63%)	1,121 (37%)
2009-2010	2,551	1,692 (66%)	859 (34%)
2008-2009	2,600	1,828 (70%)	772 (30%)
2007-2008	2,373	1,482 (62%)	891 (38%)
2006-2007	2,498	1,608 (64%)	890 (36%)
2005-2006	2,314	1,314 (57%)	1,000 (43%)
2004-2005	2,012	1,421 (71%)	591 (29%)
2003-2004	1,474	785 (53%)	689 (47%)
2002-2003	1,851	1,242 (67%)	609 (33%)
2001-2002	1,327	757 (57%)	570 (43%)
2000-2001	1,500	941 (63%)	559 (37%)
1999-2000	548	418 (76%)	131 (24%)
1998-1999	389	171 (44%)	218 (56%)
1997-1998	434	210 (48%)	224 (52%)
1996-1997	560	276 (49%)	284 (51%)
1995-1996	141	58 (41%)	83 (59%)

Grumman (429), Boeing Corp. (275), Texas Instruments (254), Raytheon (239), RTS (217), Infineon (181), Renesas (173), Sandia Nat Lab (168), Navy Crane (152), VPT Inc (151.5), NASA JPL (119), Honeywell (115), Air Force (106), SEAKR (104), Amazon (93), Draper (72), Blue Origin (68.5), Space X (64), Cobham (56), Vanderbilt (48), Axiom Space (48), BAE Systems (48), Millennium (48), Intel (46), Fifth Gait (40), NASA GSFC (36), BroadCom (32), L3Harris (32), Lockheed Martin (32), Microchip (32), Crane AE (31), Utah State (28), NASA JSC (24), Analog Devices (24), General Dynamics (24), Troxel Engineering (24), DRS (20), Johns Hopkins (16), SMU (16), Avalanche (16), Ball Aerospace (16), GSI Technology (16), Intuitive Machines (16), Smiths Interconnect (16), T2 Research (16), TruVentic (13), TAMU Physics (9), TAMU EE (8), Cisco (8), EPC Space LLC (8), MOOG (8), mPower Tech (8), NanoSperse (8). NanoSperse and TruVentic were the only new users.

Table I compares the facility usage by commercial and government customers. While commercial hours still dominate, the ratio from this reporting year (81% to 19%) is similar to usage from previous reporting periods (see Fig 1). Commercial usage increased by 28% and was the highest commercial usage ever. Government usage decreased by 16% and was the lowest usage since the 2004 – 2005 reporting period. This was mostly due to the ongoing travel restrictions of the COVID-19 pandemic. The 15 MeV/u ions were the most utilized and especially 15 MeV/u Au, until the K500 cyclotron RF system had failures in December. Then 24.8 MeV/u Xe was the highest ion in demand. No new beams were added to the K500 cyclotron SEELine users list. Much of the testing conducted at the facility continues to be for

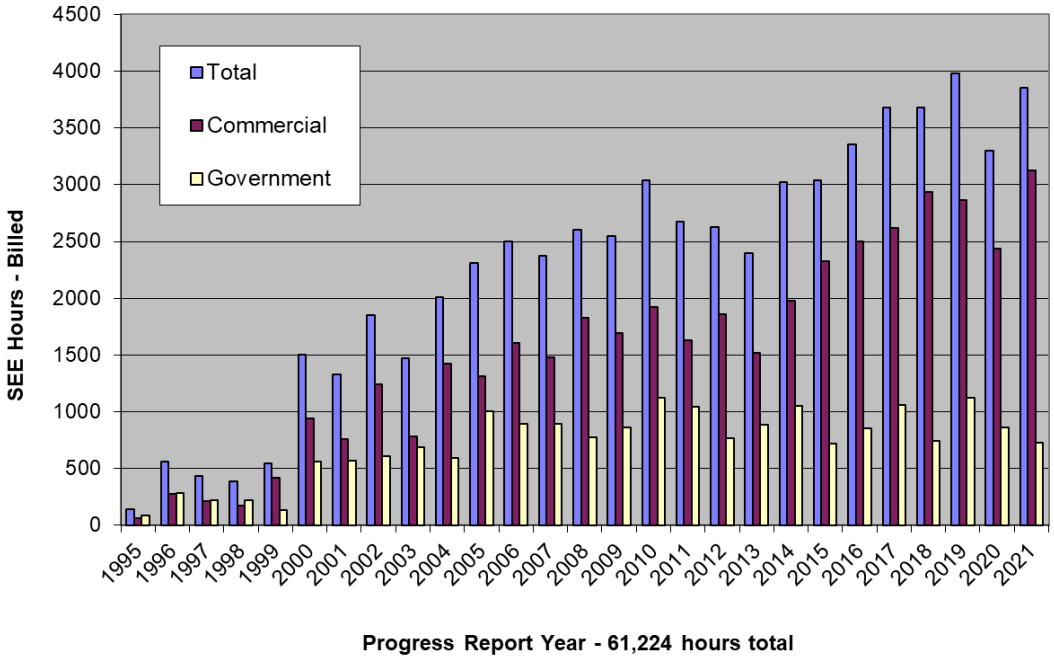

Fig. 1. Radiation Effects Facility usage by commercial and government customers for this and previous reporting years. While commercial hours still dominate, the ratio from this reporting year (81% to 19%) is similar compared to usage from prior reporting period. Usage hours increased to the second higher amount in history. 61,224 hours have been provided since the start of the project in 1995.

defense systems by both government and commercial agencies. We had no foreign users at the facility as a consequence of COVID-19 travel restrictions.