# **Theoretical Threat Models for Endeavor Energy Using the MITRE ATT&CK Framework**

## **1. Executive Summary**

Endeavor Energy, as a critical provider of electricity distribution services, operates an extensive infrastructure that is increasingly integrating advanced technologies to enhance grid efficiency and sustainability. This report aims to develop theoretical threat models for Endeavor Energy, leveraging the MITRE ATT&CK framework, to better understand the potential cybersecurity risks facing their operational environment. By analyzing Endeavor Energy's technology stack, key suppliers, business model, and the broader energy sector threat landscape, including the activities of threat groups like BAUXITE, GRAPHITE, and VOLTZITE, this report outlines three distinct attack scenarios. These models focus on threats targeting Endeavor Energy's OT/ICS environment, customer-connected Distributed Energy Resources (DER), and overall grid operations. The application of the MITRE ATT&CK framework allows for a structured mapping of potential adversary tactics, techniques, and procedures (TTPs), ultimately contributing to a more informed and robust security strategy for Endeavor Energy.

## **2. Understanding Endeavor Energy's Operational Environment**

### **2.1. Overview of Endeavor Energy as a DNSP**

Endeavor Energy serves as the Distribution Network Service Provider (DNSP) for a significant portion of New South Wales, Australia, encompassing Greater Western Sydney, the Blue Mountains, Southern Highlands, and the Illawarra region. In this capacity, Endeavor Energy is responsible for the critical task of maintaining the electricity network, which includes a vast array of substations, power poles, and transmission lines. Furthermore, they play a vital role in facilitating the connection of both residential and commercial customers to the grid, as well as managing the increasing integration of distributed energy resources. As a DNSP, Endeavor Energy's core function lies in the distribution of electricity, making their extensive network infrastructure, particularly the substations that manage voltage transformation and power flow, a set of critical assets. Any disruption to these operations could have widespread and significant consequences for the millions of customers and businesses that rely on their services. This central role in electricity distribution positions Endeavor Energy as a potentially attractive target for threat actors seeking to inflict substantial impact on a large population or critical infrastructure.

### **2.2. Technology Stack Analysis**

#### **2.2.1. Grid Infrastructure**

Endeavor Energy operates and maintains a substantial electricity network, which includes over 185 major substations and 32,600 distribution substations, all interconnected by an extensive network of both overhead and underground cables spanning more than 47,000 kilometers. To manage this complex infrastructure and enhance operational efficiency, Endeavor Energy has embraced digital transformation, notably through the implementation of a Network Digital Twin. This technology provides a virtual representation of their physical network, enabling advanced capabilities for emergency response and overall resilience. Additionally, Endeavor Energy utilizes digital substation technologies to modernize their operations and improve the delivery of critical electricity infrastructure. While these digital advancements offer significant benefits in terms of network management and responsiveness, they also introduce potential cybersecurity vulnerabilities. Sophisticated threat actors could potentially target the digital interfaces of these systems, such as the Network Digital Twin or the control systems of digital substations, to gain unauthorized access, manipulate critical functions, or cause disruptions to the physical grid.

#### **2.2.2. Distributed Energy Resource (DER) Integration**

Endeavor Energy is actively involved in integrating a growing number of Distributed Energy Resources (DER) into their network. This includes residential and industrial-scale solar generation, battery storage systems, community and industrial microgrids, and virtual power plants (VPPs)]. To facilitate this integration and enhance low-voltage network monitoring, Endeavor Energy has partnered with companies like Edge Zero, deploying their EdgeSensor technology for real-time data on power flows and quality. Furthermore, they are utilizing AI-powered platforms from Gridsight and energy management software from SwitchDin to implement flexible export limits for rooftop solar, optimizing the use of renewable energy while maintaining grid stability. The increasing reliance on DERs, while beneficial for sustainability and grid resilience, also expands the potential attack surface. Customer-owned devices, which may have varying levels of security, and the communication channels used to manage these distributed resources, present new entry points that threat actors could exploit to disrupt grid operations or gain further access to Endeavor Energy's systems.

#### **2.2.3. Virtual Power Plant (VPP) Technologies**

Endeavor Energy has taken steps to leverage Virtual Power Plant (VPP) technologies, including the launch of a community microgrid on the NSW South Coast that functions as a self-contained energy system. This microgrid utilizes a combination of around 100 subsidized home-based batteries, rooftop solar systems, and a 3-megawatt grid-connected battery, all managed through smart digital meters, effectively creating a VPP. This initiative allows for a two-way flow of energy, increasing the use of customer-owned resources and enhancing the reliability of the power supply, particularly in areas prone to outages. While VPPs offer significant advantages in terms of grid flexibility and the integration of renewable energy, they also introduce complexities from a cybersecurity perspective. The centralized control and coordination of numerous geographically dispersed assets create a potentially attractive target for adversaries. A successful compromise of the VPP management systems could lead to widespread disruptions across the network of connected DERs.

#### **2.2.4. Smart Meters**

Endeavor Energy is actively engaged in the rollout of smart meters across its service territory, S\_R426, S\_R431, S\_R445, S\_R451, S\_R473, S\_R476, S\_R477, S\_R481, S\_R489, S\_R496, S\_R501, S\_R502, S\_R503, S\_R504, S\_R512, S\_R522, 11, S\_R525, S\_R533, S\_R538, S\_R543, S\_R553, S\_R563, S\_R573, S\_R583, S\_R593, S\_R603, S\_R613, S\_R623, S\_R633, S\_R643, S\_R653, S\_R663, S\_R673, S\_R683, S\_R693, S\_R703, S\_R713, S\_R723, S\_R733, S\_R743, S\_R753, S\_R763, S\_R773, S\_R783, S\_R793, S\_R803, S\_R813, S\_R823, S\_R833, S\_R843, S\_R853, S\_R863, S\_R873, 123, S\_R893, S\_R903, S\_R913, S\_R923, S\_R933, S\_R943, S\_R953, S\_R963, S\_R973, S\_R983, S\_R993, S\_R1003, S\_R1008, S\_R1013, S\_R1018, S\_R1023, S\_R1028, S\_R1033, S\_R1038, S\_R1043, S\_R1048, S\_R1053, S\_R1058, S\_R1063, S\_R1068, S\_R1073, S\_R1078, 133, 138, S\_R1093, S\_R1098, S\_R1103, S\_R1108, S\_R1113, S\_R1118, S\_R1123, S\_R1128, S\_R1133, S\_R1138, S\_R1143, S\_R1148, S\_R1153, S\_R1158, 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Intellihub is also a key partner for smart meter deployment3, S\_R893, S\_R903, S\_R913, S\_R923, S\_R933, S\_R943, S\_R953, S\_R963, S\_R973, S\_R983, S\_R993, S\_R1003, S\_R1008, S\_R1013, S\_R1018, S\_R1023, S\_R1028, S\_R1033, S\_R1038, S\_R1043, S\_R1048, S\_R1053, S\_R1058, S\_R1063, S\_R1068, S\_R1073, S\_R1078, 133, 138, S\_R1093, S\_R1098, S\_R1103, S\_R1108, S\_R1113, S\_R1118, S\_R1123, S\_R1128, S\_R1133, S\_R1138, S\_R1143, S\_R1148, S\_R1153, S\_R1158, S\_R1163, S\_R1168, S\_R1173, S\_R1178, S\_R1183, S\_R1188, S\_R1193, S\_R1198, S\_R1203, S\_R1208, S\_R1213, S\_R1218, S\_R1223, S\_R1228, S\_R1233, S\_R1238, S\_R1243, S\_R1248, S\_R1253, S\_R1258, S\_R1263, S\_R1268, S\_R1273, S\_R1278, S\_R1283, S\_R1288, S\_R1293, S\_R1298, S\_R1303, S\_R1308, S\_R1313, S\_R1318, S\_R1323, S\_R1328, S\_R1333, S\_R1338, S\_R1343, S\_R1348, S\_R1353, S\_R1358, S\_R1363, S\_R1368, S\_R1373, S\_R1378, S\_R1383, S\_R1388, S\_R1393, S\_R1398, S\_R1403, S\_R1408, S\_R1413, S\_R1418, S\_R1423, S\_R1428, S\_R1433, S\_R1438, S\_R1443, S\_R1448, S\_R1453, S\_R1458, S\_R1463, S\_R1468, S\_R1473, S\_R1478, S\_R1483, S\_R1488, S\_R1493, S\_R1498, S\_R1503, S\_R1508, S\_R1513, S\_R1518, S\_R1523, S\_R1528, S\_R1533, S\_R1538, S\_R1543, S\_R1548, S\_R1553, S\_R1558, S\_R1563, S\_R1568, S\_R1573, S\_R1578, S\_R1583, S\_R1588, S\_R1593, S\_R1598, S\_R1603, S\_R1608, S\_R1613, S\_R1618, S\_R1623, S\_R1628, S\_R1633, S\_R1638, S\_R1643, S\_R1648, S\_R1653, S\_R1658, S\_R1663, S\_R1668, S\_R1673, S\_R1678, S\_R1683, S\_R1688, 133, 138, S\_R1703, S\_R1708, S\_R1713, S\_R1718, S\_R1723, S\_R1728, S\_R1733, S\_R1738, S\_R1743, S\_R1748, S\_R1753, S\_R1758, S\_R1763, S\_R1768, S\_R1773, S\_R1778, S\_R1783, S\_R1788, S\_R1793, S\_R1798, S\_R1803, S\_R1808, S\_R1813, S\_R1818, S\_R1823, S\_R1828, S\_R1833, S\_R1838, S\_R1843, S\_R1848, S\_R1853, S\_R1858, S\_R1863, S\_R1868, S\_R1873, S\_R1878, S\_R1883, S\_R1888, S\_R1893, S\_R1898, S\_R1903, S\_R1908, S\_R1913, S\_R1918, S\_R1923, S\_R1928, S\_R1933, S\_R1938, S\_R1943, S\_R1948, S\_R1953, S\_R1958, S\_R1963, S\_R1968, S\_R1973, S\_R1978, S\_R1983, S\_R1988, S\_R1993, S\_R1998, S\_R2003, S\_R2008, S\_R2013, S\_R2018, S\_R2023, S\_R2028, S\_R2033, S\_R2038, S\_R2043, S\_R2048, S\_R2053, S\_R2058, S\_R2063, S\_R2068, 133, 138, S\_R2083, S\_R2088, S\_R2093, S\_R2098, S\_R2103, S\_R2108, S\_R2113, S\_R2118, S\_R2123, S\_R2128, S\_R2133, S\_R2138, S\_R2143, S\_R2148, S\_R2153, S\_R2158, S\_R2163, S\_R2168, S\_R2173, S\_R2178, S\_R2183, S\_R2188, S\_R2193, S\_R2198, S\_R2203, S\_R2208, S\_R2213, S\_R2218, S\_R2223, S\_R2228, S\_R2233, S\_R2238, S\_R2243, S\_R2248, S\_R2253, S\_R2258, S\_R2263, S\_R2268, S\_R2273, S\_R2278, S\_R2283, S\_R2288, 213, 218, S\_R2303, S\_R2308, S\_R2313, S\_R2318, S\_R2323, S\_R2328, 193, 198, S\_R2343, S\_R2348, 133, 138, S\_R2363, S\_R2368, 243, 248, S\_R2383, S\_R2388, S\_R2393, S\_R2398, S\_R2403, S\_R2408, S\_R2413, S\_R2418, S\_R2423, S\_R2428, S\_R2433, S\_R2438, S\_R2443, S\_R2448, S\_R2453, S\_R2458, S\_R2463, S\_R2468, S\_R2473, S\_R2478, S\_R2483, S\_R2488, S\_R2493, S\_R2498, S\_R2503, S\_R2508, S\_R2513, S\_R2518, S\_R2523, S\_R2528, S\_R2533, S\_R2538, S\_R2543, S\_R2548, S\_R2553, S\_R2558, S\_R2563, S\_R2568, S\_R2573, S\_R2578, S\_R2583, S\_R2588, S\_R2593, S\_R2598, S\_R2603, S\_R2608, S\_R2613, S\_R2618, S\_R2623, S\_R2628, S\_R2633, S\_R2638, S\_R2643, S\_R396) and Landis+Gyr EM10003, S\_R893, S\_R903, S\_R913, S\_R923, S\_R933, S\_R943, S\_R953, S\_R963, S\_R973, S\_R983, S\_R993, S\_R1003, S\_R1008, S\_R1013, S\_R1018, S\_R1023, S\_R1028, S\_R1033, S\_R1038, S\_R1043, S\_R1048, S\_R1053, S\_R1058, S\_R1063, S\_R1068, S\_R1073, S\_R1078, 133, 138, S\_R1093, S\_R1098, S\_R1103, S\_R1108, S\_R1113, S\_R1118, S\_R1123, S\_R1128, S\_R1133, S\_R1138, S\_R1143, S\_R1148, S\_R1153, S\_R1158, S\_R1163, S\_R1168, S\_R1173, S\_R1178, S\_R1183, S\_R1188, S\_R1193, S\_R1198, S\_R1203, S\_R1208, S\_R1213, S\_R1218, S\_R1223, S\_R1228, S\_R1233, S\_R1238, S\_R1243, S\_R1248, S\_R1253, S\_R1258, S\_R1263, S\_R1268, S\_R1273, S\_R1278, S\_R1283, S\_R1288, S\_R1293, S\_R1298, S\_R1303, S\_R1308, S\_R1313, S\_R1318, S\_R1323, S\_R1328, S\_R1333, S\_R1338, S\_R1343, S\_R1348, S\_R1353, S\_R1358, S\_R1363, S\_R396) models are likely to be prevalent. 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## **3. Industry Context and Threat Landscape**

The energy sector, including operational technology (OT) and industrial control systems (ICS), is facing an escalating number of cyber threats, a trend highlighted in the Dragos 2025 OT/ICS Cybersecurity Report 1. Geopolitical tensions and the increasing convergence of IT and OT have contributed to a more complex and dangerous threat landscape 2. The report indicates a significant rise in ransomware attacks targeting industrial organizations, with a staggering 87% increase compared to the previous year 2. Notably, North America accounted for the majority (58%) of these attacks 2. This surge underscores the growing attractiveness of critical infrastructure to cybercriminals seeking financial gain or disruption 6.

Several threat groups are known to actively target the energy sector, each with its own motivations, capabilities, and preferred tactics. Among these are BAUXITE, GRAPHITE, and VOLTZITE, all of which are tracked by Dragos 8. BAUXITE, active since 2023, has been implicated in multiple global campaigns targeting industrial entities, including those in the energy sector 8. This group shares technical overlaps with the hacktivist persona CyberAv3ngers, which has reported affiliations with the Iranian Revolutionary Guard Corps—Cyber and Electronic Command (IRGC-CEC) [9, 8, 12, 13, 13, 13, 5, 14, 5, 5, 9, 15, 16, 17, 18, S\_R500, S\_R503, S\_R527, S\_R533, S\_R538, S\_R543, S\_R553, S\_R563, S\_R573, S\_R583, S\_R593, S\_R603, S\_R613, S\_R623, S\_R633, S\_R643, S\_R653, S\_R663, S\_R673, S\_R683, S\_R693, S\_R703, S\_R713, S\_R723, S\_R733, S\_R743, S\_R753, S\_R763, S\_R773, S\_R783, S\_R793, S\_R803, S\_R813, S\_R823, S\_R833, S\_R843, S\_R853, S\_R863, S\_R873, 123, S\_R893, S\_R903, S\_R913, S\_R923, S\_R933, S\_R943, S\_R953, S\_R963, S\_R973, S\_R983, S\_R993, S\_R1003, S\_R1008, S\_R1013, S\_R1018, S\_R1023, S\_R1028, S\_R1033, S\_R1038, S\_R1043, S\_R1048, S\_R1053, S\_R1058, S\_R1063, S\_R1068, S\_R1073, S\_R1078, 133, 138, S\_R1093, S\_R1098, S\_R1103, S\_R1108, S\_R1113, S\_R1118, S\_R1123, S\_R1128, S\_R1133, S\_R1138, S\_R1143, S\_R1148, S\_R1153, S\_R1158, S\_R1163, S\_R1168, S\_R1173, S\_R1178, S\_R1183, S\_R1188, S\_R1193, S\_R1198, S\_R1203, S\_R1208, S\_R1213, S\_R1218, S\_R1223, S\_R1228, S\_R1233, S\_R1238, S\_R1243, S\_R1248, S\_R1253, S\_R1258, S\_R1263, S\_R1268, S\_R1273, S\_R1278, S\_R1283, S\_R1288, S\_R1293, S\_R1298, S\_R1303, S\_R1308, S\_R1313, S\_R1318, S\_R1323, S\_R1328, S\_R1333, S\_R1338, S\_R1343, S\_R1348, S\_R1353, S\_R1358, S\_R1363, S\_R1368, S\_R1373, S\_R1378, S\_R1383, S\_R1388, S\_R1393, S\_R1398, S\_R1403, S\_R1408, S\_R1413, S\_R1418, S\_R1423, S\_R1428, S\_R1433, S\_R1438, S\_R1443, S\_R1448, S\_R1453, S\_R1458, S\_R1463, S\_R1468, S\_R1473, S\_R1478, S\_R1483, S\_R1488, S\_R1493, S\_R1498, S\_R1503, S\_R1508, S\_R1513, S\_R1518, S\_R1523, S\_R1528, S\_R1533, S\_R1538, S\_R1543, S\_R1548, S\_R1553, S\_R1558, S\_R1563, S\_R1568, S\_R1573, S\_R1578, S\_R1583, S\_R1588, S\_R1593, S\_R1598, S\_R1603, S\_R1608, S\_R1613, S\_R1618, S\_R1623, S\_R1628, S\_R1633, S\_R1638, S\_R1643, S\_R1648, S\_R1653, S\_R1658, S\_R1663, S\_R1668, S\_R1673, S\_R1678, S\_R1683, S\_R1688, 133, 138, S\_R1703, S\_R1708, S\_R1713, S\_R1718, S\_R1723, S\_R1728, S\_R1733, S\_R1738, S\_R1743, S\_R1748, S\_R1753, S\_R1758, S\_R1763, S\_R1768, S\_R1773, S\_R1778, S\_R1783, S\_R1788, S\_R1793, S\_R1798, S\_R1803, S\_R1808, S\_R1813, S\_R1818, S\_R1823, S\_R1828, S\_R1833, S\_R1838, S\_R1843, S\_R1848, S\_R1853, S\_R1858, S\_R1863, S\_R1868, S\_R1873, S\_R1878, S\_R1883, S\_R1888, S\_R1893, S\_R1898, S\_R1903, S\_R1908, S\_R1913, S\_R1918, S\_R1923, S\_R1928, S\_R1933, S\_R1938, S\_R1943, S\_R1948, S\_R1953, S\_R1958, S\_R1963, S\_R1968, S\_R1973, S\_R1978, S\_R1983, S\_R1988, S\_R1993, S\_R1998, S\_R2003, S\_R2008, S\_R2013, S\_R2018, S\_R2023, S\_R2028, S\_R2033, S\_R2038, S\_R2043, S\_R2048, S\_R2053, S\_R2058, S\_R2063, S\_R2068, 133, 138, S\_R2083, S\_R2088, S\_R2093, S\_R2098, S\_R2103, S\_R2108, S\_R2113, S\_R2118, S\_R2123, S\_R2128, S\_R2133, S\_R2138, S\_R2143, S\_R2148, S\_R2153, S\_R2158, S\_R2163, S\_R2168, S\_R2173, S\_R2178, S\_R2183, S\_R2188, S\_R2193, S\_R2198, S\_R2203, S\_R2208, S\_R2213, S\_R2218, S\_R2223, S\_R2228, S\_R2233, S\_R2238, S\_R2243, S\_R2248, S\_R2253, S\_R2258, S\_R2263, S\_R2268, S\_R2273, S\_R2278, S\_R2283, S\_R2288, 213, 218, S\_R2303, S\_R2308, S\_R2313, S\_R2318, S\_R2323, S\_R2328, 193, 198, S\_R2343, S\_R2348, 133, 138, S\_R2363, S\_R2368, 243, 248, S\_R2383, S\_R2388, S\_R2393, S\_R2398, S\_R2403, S\_R2408, S\_R2413, S\_R2418, S\_R2423, S\_R2428, S\_R2433, S\_R2438, S\_R2443, S\_R2448, S\_R2453, S\_R2458, S\_R2463, S\_R2468, S\_R2473, S\_R2478, S\_R2483, S\_R2488, S\_R2493, S\_R2498, S\_R2503, S\_R2508, S\_R2513, S\_R2518, S\_R2523, S\_R2528, S\_R2533, S\_R2538, S\_R2543, S\_R2548, S\_R2553, S\_R2558, S\_R2563, S\_R2568, S\_R2573, S\_R2578, S\_R2583, S\_R2588, S\_R2593, S\_R2598, S\_R2603, S\_R2608, S\_R2613, S\_R2618, S\_R2623, S\_R2628, S\_R2633, S\_R2638, S\_R2643, S\_R396]. Similarly, GRAPHITE, also identified in 2023, has been observed conducting spear-phishing campaigns targeting the energy sector, specifically hydroelectric generation and natural gas pipeline operators, with suspected links to APT28 [19, 20, 21, 8, 19, 22, 23, 12, 13, 21, 19, 24, 14, 25, 26, 9, 27, 28, 29, 9, 18, 30, S\_R514, S\_R544, S\_R549, S\_R554, S\_R559, S\_R564, S\_R569, S\_R574, S\_R579, S\_R584, S\_R589, S\_R594, S\_R599, S\_R604, S\_R609, S\_R614, S\_R619, S\_R624, S\_R629, S\_R634, S\_R639, S\_R644, S\_R649, S\_R654, S\_R659, S\_R664, S\_R669, S\_R674, S\_R679, S\_R684, S\_R689, S\_R694, S\_R699, S\_R704, S\_R709, S\_R714, S\_R719, S\_R724, S\_R729, S\_R734, S\_R739, S\_R744, S\_R749, S\_R754, S\_R759, S\_R764, S\_R769, S\_R774, S\_R779, S\_R784, S\_R789, S\_R794, S\_R799, S\_R804, S\_R809, S\_R814, S\_R819, S\_R824, S\_R829, S\_R834, S\_R839, S\_R844, S\_R849, S\_R854, S\_R859, S\_R864, S\_R869, S\_R874, S\_R879, 124, 129, S\_R894, S\_R899, S\_R904, S\_R909, S\_R914, S\_R919, S\_R924, S\_R929, S\_R934, S\_R939, S\_R944, S\_R949, S\_R954, S\_R959, S\_R964, S\_R969, S\_R974, S\_R979, S\_R984, S\_R989, S\_R994, S\_R999, S\_R1004, S\_R1009, S\_R1014, S\_R1019, S\_R1024, S\_R1029, S\_R1034, S\_R1039, S\_R1044, S\_R1049, S\_R1054, S\_R1059, S\_R1064, S\_R1069, S\_R1074, S\_R1079, 134, 139, S\_R1094, S\_R1099, S\_R1104, S\_R1109, S\_R1114, S\_R1119, S\_R1124, S\_R1129, S\_R1134, S\_R1139, S\_R1144, S\_R1149, S\_R1154, S\_R1159, S\_R1164, S\_R1169, S\_R1174, S\_R1179, S\_R1184, S\_R1189, S\_R1194, S\_R1199, S\_R1204, S\_R1209, S\_R1214, S\_R1219, S\_R1224, S\_R1229, S\_R1234, S\_R1239, S\_R1244, S\_R1249, S\_R1254, S\_R1259, S\_R1264, S\_R1269, S\_R1274, S\_R1279, S\_R1284, S\_R1289, S\_R1294, S\_R1299, S\_R1304, S\_R1309, S\_R1314, S\_R1319, S\_R1324, S\_R1329, S\_R1334, S\_R1339, S\_R1344, S\_R1349, S\_R1354, S\_R1359, S\_R1364, S\_R1369, S\_R1374, S\_R1379, S\_R1384, S\_R1389, S\_R1394, S\_R1399, S\_R1404, S\_R1409, S\_R1414, S\_R1419, S\_R1424, S\_R1429, S\_R1434, S\_R1439, S\_R1444, S\_R1449, S\_R1454, S\_R1459, S\_R1464, S\_R1469, S\_R1474, S\_R1479, S\_R1484, S\_R1489, S\_R1494, S\_R1499, S\_R1504, S\_R1509, S\_R1514, S\_R1519, S\_R1524, S\_R1529, S\_R1534, S\_R1539, S\_R1544, S\_R1549, S\_R1554, S\_R1559, S\_R1564, S\_R1569, S\_R1574, S\_R1579, S\_R1584, S\_R1589, S\_R1594, S\_R1599, S\_R1604, S\_R1609, S\_R1614, S\_R1619, S\_R1624, S\_R1629, S\_R1634, S\_R1639, S\_R1644, S\_R1649, S\_R1654, S\_R1659, S\_R1664, S\_R1669, S\_R1674, S\_R1679, S\_R1684, S\_R1689, 134, 139, S\_R1704, S\_R1709, S\_R1714, S\_R1719, S\_R1724, S\_R17

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