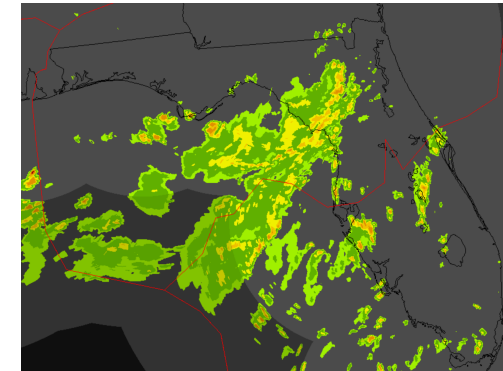


Overcoming the Challenges of Data Integration and Automation



- **Leveraging and fusing heterogeneous data**

- Flight Operational Quality Assurance Data (FOQA)
 - Aircraft centric view (usually de-identified)
- Weather (current/forecast)
 - Identify levels of severity that impact traveled routes and planning.
- Radar Surveillance
 - Captures interactions with other flights
- Procedural Information
 - Standard Operating Procedures
 - RNAV Arrivals/Departures
- NOTAMs
 - Changes that may disrupt normal planned operations.
- Pilot/Controller Safety Reports
 - Captures context and trends of safety incidents.



14 CFR 99.7, 99.101, 99.103, 99.105, 99.107, 99.109, 99.111, 99.113, 99.115, 99.117, 99.119, 99.121, 99.123, 99.125, 99.127, 99.129, 99.131, 99.133, 99.135, 99.137, 99.139, 99.141, 99.143, 99.145, 99.147, 99.149, 99.151, 99.153, 99.155, 99.157, 99.159, 99.161, 99.163, 99.165, 99.167, 99.169, 99.171, 99.173, 99.175, 99.177, 99.179, 99.181, 99.183, 99.185, 99.187, 99.189, 99.191, 99.193, 99.195, 99.197, 99.199, 99.201, 99.203, 99.205, 99.207, 99.209, 99.211, 99.213, 99.215, 99.217, 99.219, 99.221, 99.223, 99.225, 99.227, 99.229, 99.231, 99.233, 99.235, 99.237, 99.239, 99.241, 99.243, 99.245, 99.247, 99.249, 99.251, 99.253, 99.255, 99.257, 99.259, 99.261, 99.263, 99.265, 99.267, 99.269, 99.271, 99.273, 99.275, 99.277, 99.279, 99.281, 99.283, 99.285, 99.287, 99.289, 99.291, 99.293, 99.295, 99.297, 99.299, 99.301, 99.303, 99.305, 99.307, 99.309, 99.311, 99.313, 99.315, 99.317, 99.319, 99.321, 99.323, 99.325, 99.327, 99.329, 99.331, 99.333, 99.335, 99.337, 99.339, 99.341, 99.343, 99.345, 99.347, 99.349, 99.351, 99.353, 99.355, 99.357, 99.359, 99.361, 99.363, 99.365, 99.367, 99.369, 99.371, 99.373, 99.375, 99.377, 99.379, 99.381, 99.383, 99.385, 99.387, 99.389, 99.391, 99.393, 99.395, 99.397, 99.399, 99.401, 99.403, 99.405, 99.407, 99.409, 99.411, 99.413, 99.415, 99.417, 99.419, 99.421, 99.423, 99.425, 99.427, 99.429, 99.431, 99.433, 99.435, 99.437, 99.439, 99.441, 99.443, 99.445, 99.447, 99.449, 99.451, 99.453, 99.455, 99.457, 99.459, 99.461, 99.463, 99.465, 99.467, 99.469, 99.471, 99.473, 99.475, 99.477, 99.479, 99.481, 99.483, 99.485, 99.487, 99.489, 99.491, 99.493, 99.495, 99.497, 99.499, 99.501, 99.503, 99.505, 99.507, 99.509, 99.511, 99.513, 99.515, 99.517, 99.519, 99.521, 99.523, 99.525, 99.527, 99.529, 99.531, 99.533, 99.535, 99.537, 99.539, 99.541, 99.543, 99.545, 99.547, 99.549, 99.551, 99.553, 99.555, 99.557, 99.559, 99.561, 99.563, 99.565, 99.567, 99.569, 99.571, 99.573, 99.575, 99.577, 99.579, 99.581, 99.583, 99.585, 99.587, 99.589, 99.591, 99.593, 99.595, 99.597, 99.599, 99.601, 99.603, 99.605, 99.607, 99.609, 99.611, 99.613, 99.615, 99.617, 99.619, 99.621, 99.623, 99.625, 99.627, 99.629, 99.631, 99.633, 99.635, 99.637, 99.639, 99.641, 99.643, 99.645, 99.647, 99.649, 99.651, 99.653, 99.655, 99.657, 99.659, 99.661, 99.663, 99.665, 99.667, 99.669, 99.671, 99.673, 99.675, 99.677, 99.679, 99.681, 99.683, 99.685, 99.687, 99.689, 99.691, 99.693, 99.695, 99.697, 99.699, 99.701, 99.703, 99.705, 99.707, 99.709, 99.711, 99.713, 99.715, 99.717, 99.719, 99.721, 99.723, 99.725, 99.727, 99.729, 99.731, 99.733, 99.735, 99.737, 99.739, 99.741, 99.743, 99.745, 99.747, 99.749, 99.751, 99.753, 99.755, 99.757, 99.759, 99.761, 99.763, 99.765, 99.767, 99.769, 99.771, 99.773, 99.775, 99.777, 99.779, 99.781, 99.783, 99.785, 99.787, 99.789, 99.791, 99.793, 99.795, 99.797, 99.799, 99.801, 99.803, 99.805, 99.807, 99.809, 99.811, 99.813, 99.815, 99.817, 99.819, 99.821, 99.823, 99.825, 99.827, 99.829, 99.831, 99.833, 99.835, 99.837, 99.839, 99.841, 99.843, 99.845, 99.847, 99.849, 99.851, 99.853, 99.855, 99.857, 99.859, 99.861, 99.863, 99.865, 99.867, 99.869, 99.871, 99.873, 99.875, 99.877, 99.879, 99.881, 99.883, 99.885, 99.887, 99.889, 99.891, 99.893, 99.895, 99.897, 99.899, 99.901, 99.903, 99.905, 99.907, 99.909, 99.911, 99.913, 99.915, 99.917, 99.919, 99.921, 99.923, 99.925, 99.927, 99.929, 99.931, 99.933, 99.935, 99.937, 99.939, 99.941, 99.943, 99.945, 99.947, 99.949, 99.951, 99.953, 99.955, 99.957, 99.959, 99.961, 99.963, 99.965, 99.967, 99.969, 99.971, 99.973, 99.975, 99.977, 99.979, 99.981, 99.983, 99.985, 99.987, 99.989, 99.991, 99.993, 99.995, 99.997, 99.999, 100.001, 100.003, 100.005, 100.007, 100.009, 100.011, 100.013, 100.015, 100.017, 100.019, 100.021, 100.023, 100.025, 100.027, 100.029, 100.031, 100.033, 100.035, 100.037, 100.039, 100.041, 100.043, 100.045, 100.047, 100.049, 100.051, 100.053, 100.055, 100.057, 100.059, 100.061, 100.063, 100.065, 100.067, 100.069, 100.071, 100.073, 100.075, 100.077, 100.079, 100.081, 100.083, 100.085, 100.087, 100.089, 100.091, 100.093, 100.095, 100.097, 100.099, 100.101, 100.103, 100.105, 100.107, 100.109, 100.111, 100.113, 100.115, 100.117, 100.119, 100.121, 100.123, 100.125, 100.127, 100.129, 100.131, 100.133, 100.135, 100.137, 100.139, 100.141, 100.143, 100.145, 100.147, 100.149, 100.151, 100.153, 100.155, 100.157, 100.159, 100.161, 100.163, 100.165, 100.167, 100.169, 100.171, 100.173, 100.175, 100.177, 100.179, 100.181, 100.183, 100.185, 100.187, 100.189, 100.191, 100.193, 100.195, 100.197, 100.199, 100.201, 100.203, 100.205, 100.207, 100.209, 100.211, 100.213, 100.215, 100.217, 100.219, 100.221, 100.223, 100.225, 100.227, 100.229, 100.231, 100.233, 100.235, 100.237, 100.239, 100.241, 100.243, 100.245, 100.247, 100.249, 100.251, 100.253, 100.255, 100.257, 100.259, 100.261, 100.263, 100.265, 100.267, 100.269, 100.271, 100.273, 100.275, 100.277, 100.279, 100.281, 100.283, 100.285, 100.287, 100.289, 100.291, 100.293, 100.295, 100.297, 100.299, 100.301, 100.303, 100.305, 100.307, 100.309, 100.311, 100.313, 100.315, 100.317, 100.319, 100.321, 100.323, 100.325, 100.327, 100.329, 100.331, 100.333, 100.335, 100.337, 100.339, 100.341, 100.343, 100.345, 100.347, 100.349, 100.351, 100.353, 100.355, 100.357, 100.359, 100.361, 100.363, 100.365, 100.367, 100.369, 100.371, 100.373, 100.375, 100.377, 100.379, 100.381, 100.383, 100.385, 100.387, 100.389, 100.391, 100.393, 100.395, 100.397, 100.399, 100.401, 100.403, 100.405, 100.407, 100.409, 100.411, 100.413, 100.415, 100.417, 100.419, 100.421, 100.423, 100.425, 100.427, 100.429, 100.431, 100.433, 100.435, 100.437, 100.439, 100.441, 100.443, 100.445, 100.447, 100.449, 100.451, 100.453, 100.455, 100.457, 100.459, 100.461, 100.463, 100.465, 100.467, 100.469, 100.471, 100.473, 100.475, 100.477, 100.479, 100.481, 100.483, 100.485, 100.487, 100.489, 100.491, 100.493, 100.495, 100.497, 100.499, 100.501, 100.503, 100.505, 100.507, 100.509, 100.511, 100.513, 100.515, 100.517, 100.519, 100.521, 100.523, 100.525, 100.527, 100.529, 100.531, 100.533, 100.535, 100.537, 100.539, 100.541, 100.543, 100.545, 100.547, 100.549, 100.551, 100.553, 100.555, 100.557, 100.559, 100.561, 100.563, 100.565, 100.567, 100.569, 100.571, 100.573, 100.575, 100.577, 100.579, 100.581, 100.583, 100.585, 100.587, 100.589, 100.591, 100.593, 100.595, 100.597, 100.599, 100.601, 100.603, 100.605, 100.607, 100.609, 100.611, 100.613, 100.615, 100.617, 100.619, 100.621, 100.623, 100.625, 100.627, 100.629, 100.631, 100.633, 100.635, 100.637, 100.639, 100.641, 100.643, 100.645, 100.647, 100.649, 100.651, 100.653, 100.655, 100.657, 100.659, 100.661, 100.663, 100.665, 100.667, 100.669, 100.671, 100.673, 100.675, 100.677, 100.679, 100.681, 100.683, 100.685, 100.687, 100.689, 100.691, 100.693, 100.695, 100.697, 100.699, 100.701, 100.703, 100.705, 100.707, 100.709, 100.711, 100.713, 100.715, 100.717, 100.719, 100.721, 100.723, 100.725, 100.727, 100.729, 100.731, 100.733, 100.735, 100.737, 100.739, 100.741, 100.743, 100.745, 100.747, 100.749, 100.751, 100.753, 100.755, 100.757, 100.759, 100.761, 100.763, 100.765, 100.767, 100.769, 100.771, 100.773, 100.775, 100.777, 100.779, 100.781, 100.783, 100.785, 100.787, 100.789, 100.791, 100.793, 100.795, 100.797, 100.799, 100.801, 100.803, 100.805, 100.807, 100.809, 100.811, 100.813, 100.815, 100.817, 100.819, 100.821, 100.823, 100.825, 100.827, 100.829, 100.831, 100.833, 100.835, 100.837, 100.839, 100.841, 100.843, 100.845, 100.847, 100.849, 100.851, 100.853, 100.855, 100.857, 100.859, 100.861, 100.863, 100.865, 100.867, 100.869, 100.871, 100.873, 100.875, 100.877, 100.879, 100.881, 100.883, 100.885, 100.887, 100.889, 100.891, 100.893, 100.895, 100.897, 100.899, 100.901, 100.903, 100.905, 100.907, 100.909, 100.911, 100.913, 100.915, 100.917, 100.919, 100.921, 100.923, 100.925, 100.927, 100.929, 100.931, 100.933, 100.935, 100.937, 100.939, 100.941, 100.943, 100.945, 100.947, 100.949, 100.951, 100.953, 100.955, 100.957, 100.959, 100.961, 100.963, 100.965, 100.967, 100.969, 100.971, 100.973, 100.975, 100.977, 100.979, 100.981, 100.983, 100.985, 100.987, 100.989, 100.991, 100.993, 100.995, 100.997, 100.999, 101.001, 101.003, 101.005, 101.007, 101.009, 101.011, 101.013, 101.015, 101.017, 101.019, 101.021, 101.023, 101.025, 101.027, 101.029, 101.031, 101.033, 101.035, 101.037, 101.039, 101.041, 101.043, 101.045, 101.047, 101.049, 101.051, 101.053, 101.055, 101.057, 101.059, 101.061, 101.063, 101.065, 101.067, 101.069, 101.071, 101.073, 101.075, 101.077, 101.079, 101.081, 101.083, 101.085, 101.087, 101.089, 101.091, 101.093, 101.095, 101.097, 101.099, 101.101, 101.103, 101.105, 101.107, 101.109, 101.111, 101.113, 101.115, 101.117, 101.119, 101.121, 101.123, 101.125, 101.127, 101.129, 101.131, 101.133, 101.135, 101.137, 101.139, 101.141, 101.143, 101.145, 101.147, 101.149, 101.151, 101.153, 101.155, 101.157, 101.159, 101.161, 101.163, 101.165, 101.167, 101.169, 101.171, 101.173, 101.175, 101.177, 101.179, 101.181, 101.183, 101.185, 101.187, 101.189, 101.191, 101.193, 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