The 2018 Research Topical Symposium (RTS) was held during NACE International's CORROSION 2018 conference in Phoenix in memory of Roger Staehle, who passed away unexpectedly in January of 2017. An article describing his career, his passion for corrosion, and his contributions to NACE appeared in the March 2017 issue of CORROSION. Suffice it to say, the entire corrosion community, as well as the NACE technical and research committee membership, held Roger Staehle in such high regard that it was an obvious decision to convene a day-long RTS session in his memory.

The annual RTS session brought together researchers and practitioners with common interests in the field of corrosion. The program contained only invited speakers, who were given the opportunity to deliver an extended presentation summarizing their thoughts and contribution on the topic. The speakers were also invited to contribute to an issue of CORROSION dedicated to the symposium.

The RTS session started off with reflections on Roger Staehle by Ron Latanision, who earned his Ph.D. under Roger. There were then sessions on four topical areas that were of great interest to Roger: stress corrosion cracking (SCC) and power generation, oil and gas pipelines, nuclear waste, and infrastructure.

This special issue of CORROSION contains articles authored by many of the RTS speakers. The first papers address the mechanisms and prediction of SCC. Persaud, Smith, and Newman describe identification of surface precursor sites for cracking in nickel-based Alloys 800, 600, and 690 using state of the art microscopy. This is discussed in the context of the quantitative micro-nano (QMN) approach that has been promoted by Roger Staehle. Andresen reviews aspects of environmental cracking in hot water environments relevant to nuclear power generation as well as other industries. The existence of immunity, and whether there are firm thresholds, dependencies, and mechanisms are addressed. Shoji and coauthors also address various issues associated with environmental cracking, including the effects of hardened surface layers, cyclic changes in water chemistry, hydrogen effects, and Laves phase formation. Féron and coworkers report on the history of Alloy 600 stress cracking in nuclear reactors, pointing out the pioneering work of Curiou toward the detection of susceptibility. The manuscript then discusses SCC in the context of the QMN approach championed by Staehle.

Corrosion in oil and gas production environments is discussed by Nešić, et al., through a comprehensive model capable of predicting corrosion rates in oil and gas pipeline under four situations. The model incorporates the influence of carbon dioxide, hydrogen sulfide, and organic acids in the environment, as well as iron sulfide and iron carbonates films on pipe surface. The model can be interfaced with computational fluid mechanics models.

Finally, topics associate with nuclear waste storage and long-term disposal are addressed by three papers. Beavers, et al., describe the history and performance of a particular underground nuclear waste storage tank. They present corrosion and SCC results in various simulators representing the history of the tank usage in an effort to assess the corrosion mode that most likely led to the failure of the tank primary liner. Shoesmith and coworkers review a model that predicts the environmental degradation and radionuclide release of uranium dioxide spent nuclear fuel inside a compromised waste canister. Finally, King and Kolář present models that describe the performance of waste canisters in a repository environment and predict their lifetime. A variety of approaches taken by different national programs is described, with a focus on copper containers.

We hope you find this RTS to be informative for many years. Just as we savor the memory of Roger Staehle, his many accomplishments, and his great impact on the corrosion field, we hope that these papers are of enduring value as well.