Detailed Article: Key Differences Between IIAR 5-2025 and IIAR 5-2019

Introduction
The ANSI/IIAR 5 standard outlines the minimum requirements for the startup of closed-circuit ammonia refrigeration systems. The 2025 revision builds upon the 2019 edition with significant enhancements in structure, clarity, and technical content. Below is a detailed comparison of the two versions, highlighting key changes and additions.

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1. Title and Organizational Identity

- **2019**: Published by the International Institute of Ammonia Refrigeration (IIAR).
- **2025**: Now under the **International Institute of All-Natural Refrigeration**, reflecting a broader environmental focus.

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2. Scope and Applicability

- **Expanded Scope**: The 2025 version explicitly includes international installations and clarifies the treatment of in-kind replacements.
- **New Clause (1.2.4)**: Allows use of nationally recognized standards outside the U.S.
- **Clarified Conflict Resolution**: Emphasizes precedence of local codes over IIAR standards unless otherwise stated.

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3. Updated Normative References

- **IIAR 5-2025** references:
  - ASME B31.5-2022 (was 2016)
  - ANSI/IIAR 1-2022 (was 2017)
  - ANSI/IIAR 7-2025 (was 2019)
  - NFPA 70 (2023)
- **OSHA and EPA references** remain but are more clearly structured.

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4. Ammonia Purity Requirements

- **2019 Table**:
  - Water: 50–5000 ppm
  - Oil: 50 ppm max
  - Salt, pyridine, H_2S, naphthalene: None
- **2025 Table**:
  - Water: 0.5% max
  - Oil & Other: 0.1% max
  - Ammonia: 99.5% min

- **Simplified and aligned with practical charging needs**.

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5. Startup Team and Plan

- **2025**: More detailed roles and responsibilities, including guidance on combining roles for smaller projects.
- **Appendix A.5.1.1.1**: Offers practical examples of team composition.

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6. Hazard Analysis and Documentation

- **2025**: Stronger emphasis on regulatory compliance (PSM/RMP).
- **New Guidance**: Differentiates between formal PHA and simplified hazard reviews.
- **Appendix A.5.4**: Expanded explanation of hazard analysis methods.

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7. Testing and Evacuation

- **Evacuation Requirements**:
  - **2019**: 5,000 microns (1,000 if compressed air used)
  - **2025**: 125,000 microns (25" Hg) or 5,000 microns depending on system
- **New Detail**: Vacuum hold time and ambient temperature considerations added.

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8. Charging and Leak Testing

- **Final Leak Check**: Now explicitly required using ammonia vapor.
- **Transfer Hose Requirements**: More stringent inspection and certification criteria.

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9. Startup Process Enhancements

- **Verification**: Now includes digital/analog I/O and HMI testing.
- **Deviation Resolution**: Formalized with documentation requirements.
- **System Monitoring**: Clarified expectations for post-startup observation.

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10. New and Expanded Appendices

- **Appendix A**: More comprehensive explanatory notes.
- **Appendix D**: Detailed tie-in planning guidance.
- **Appendix E**: Temperature reduction procedures for freezers.

- **Appendix F**: Updated references and sources.

Conclusion
The 2025 revision of IIAR 5 reflects a maturing standard that aligns more closely with modern engineering practices, regulatory expectations, and international applicability. Facilities planning new installations or modifications should review the updated requirements carefully to ensure compliance and operational safety.

If you would like to have a further discussion or conference call meeting on the differences, please email a request to tony_lundell@iiar.org.