DRAFT

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VRS-SPC-501

Space — AR Rubric Data Twin

Machine-readable criteria, tier ceilings, contributors and bands of VRS-SPC-201 (VRS 2026 (draft)); generated, never hand-edited.

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DOCUMENT	VERSION	STATUS	DATE
VRS-SPC-501	1.0.0	Draft	16 September 2026

> **Foreword.** Data Artifact: the machine-readable twin of **VRS-SPC-201** (VRS 2026 (draft)) — the sector criteria with their point ranges, rungs and tier ceilings, the contributing intrinsic criteria, the letter bands and the application classes — generated FROM the protocol's Clause 5–7 by `tools/vrs-twin-generate.py` . Consistency is by construction and re-verified on every build (conformance check 15). The JSON in Clause 4 is the normative payload; scorer tooling consumes it directly. A change to VRS-SPC-201 and to this twin is one change instrument.

1 1 Scope

This Data Artifact carries the rubric data of the Space (SPC) sector in machine-readable form: the 8 sector criteria of VRS-SPC-201 Clause 6 with points, rungs and Unverified / Verified / Certified ceilings; the contributing intrinsic criteria of Clause 5; the letter bands and application classes of Clause 7. It states no independent requirements. Where this artifact and VRS-SPC-201 could be read to differ, VRS-SPC-201 governs and this twin is regenerated to match.

2 2 Normative references

- **VRS-SPC-201**, *Space — AR Assessment Protocol* — source protocol twinned (Clauses 5–7).
- **VRS-SPC-001**, *Space — Sector Standard* — application classes and hazard groups.
- **VRS-GEN-005**, *IR Methodology* — point sum, tier ceilings, no-evidence rule.
- **VRS-GEN-006**, *AR Scheme* — pool mechanics, letter bands, tier caps by construction.
- **VRS-GEN-002**, *Designation and Drafting Rules* — criterion layout (§6.5) and versioning.

3 3 Terms and definitions

The terms of VRS-GEN-001 and VRS-SPC-201 apply. **data twin** — a machine-readable artifact regenerated one-to-one from a source protocol's normative clauses. **rung** — a named state of a criterion awarding a stated integer number of points (VRS-GEN-002 §3.9). **ceiling** — the maximum points a criterion awards at a stated tier (VRS-GEN-002 §3.10).

4 4 Payload

Sector criteria total **100** points; ceilings Unverified **70**, Verified **85**, Certified **100**.


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{
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    "edition": "VRS 2026 (draft)",
    "source_protocol": "VRS-SPC-201 v1.0.0",
    "generated": "2026-09-16",
    "conforms_to": "VRS-GEN-005 §6 (point sum, tier ceilings); VRS-GEN-006 §6–§8 (pool, bands, tier caps by construction)"
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    "AA": 75,
    "A": 60,
    "B": 45,
    "C": 0
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    "orbital servicing/inspection",
    "lunar/planetary surface",
    "ISS/crewed-platform internal",
    "launch-support ground robotics"
  ],
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      "document": "VRS-GEN-101",
      "clause": "6.1"
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      "clause": "6.2"
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      "document": "VRS-GEN-101",
      "clause": "6.7"
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      "document": "VRS-GEN-102",
      "clause": "6.1"
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      "clause": "6.2"
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      "clause": "6.5"
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      "document": "VRS-GEN-102",
      "clause": "6.7"
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      "document": "VRS-GEN-105",
      "clause": "6.3"
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      "document": "VRS-GEN-105",
      "clause": "6.4"
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      "clause": "6.1"
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      "document": "VRS-GEN-106",
      "clause": "6.7"
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      "clause": "6.1"
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      "document": "VRS-GEN-104",
      "clause": "6.5"
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      "id": "SPC-1",
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      "points_max": 18,
      "what_is_measured": "Environmental verification campaign (thermal-vacuum, vibration, radiation) with published summaries and independen
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```

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          "points": 18,
          "state": "independent review + full campaign"
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        {
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          "points": 14,
          "state": "campaign documented + launch-provider acceptance public"
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      "not_applicable_by_class": false
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    {
      "clause": "6.2",
      "id": "SPC-2",
      "name": "Debris-mitigation and proximity-operation safety",
      "points_max": 14,
      "what_is_measured": "ISO 24113 compliance; collision-avoidance and abort logic for proximity operations.",
      "rungs": [
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          "points": 14,
          "state": "independently reviewed + abort logic demonstrated on ground twin"
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        {
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          "state": "pack-evidenced (documents), not demonstrated"
        },
        {
          "points": 10,
          "state": "documented + reviewed"
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        {
          "points": 9,
          "state": "publicly evidenced only (no pack, no demonstration)"
        },
        {
          "points": 6,
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        },
        {
          "points": 0,
          "state": "not established"
        }
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```
        "verified": 12,
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      "evidence_bar": "Mission profile declared.",
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      "not_applicable_by_class": false
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      "clause": "6.3",
      "id": "SPC-3",
      "name": "Crewed-adjacency safety (materials, offgassing, sharp edges, energy)",
      "points_max": 12,
      "what_is_measured": "Safety-review acceptance for crewed platforms; materials/offgassing data.",
      "rungs": [
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          "points": 12,
          "state": "acceptance public + witnessed inspection on ground twin"
        },
        {
          "points": 10,
          "state": "acceptance public"
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        {
          "points": 8,
          "state": "publicly evidenced only (no pack, no demonstration)"
        },
        {
          "points": 6,
          "state": "documented"
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        {
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          "state": "not established. · 0. Crewed-adjacent classes only"
        }
      ],
      "ceiling": {
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        "verified": 10,
        "certified": 12
      },
      "company_wide": null,
      "evidence_bar": "Applies to crewed-adjacent classes.",
      "applicability": "orbital servicing/inspection · lunar/planetary surface · ISS/crewed-platform internal · launch-support ground robotic
      "not_applicable_by_class": false
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      "clause": "6.4",
      "id": "SPC-4",
      "name": "Command-link loss and autonomous-behaviour bounds",
      "points_max": 14,
      "what_is_measured": "Behaviour under link loss with light-delay; autonomy divergence detection and safe modes.",
      "rungs": [
        {
          "points": 14,
          "state": "demonstrated on ground twin/simulator"
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        {
          "points": 11,
          "state": "pack-evidenced (documents), not demonstrated"
        },
        {
          "points": 10,
          "state": "validated + documented in detail"
        },
        {
          "points": 9,
          "state": "publicly evidenced only (no pack, no demonstration)"
```

```
        },
        {
          "points": 6,
          "state": "documented"
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        {
          "points": 0,
          "state": "not established"
        }
      ],
      "ceiling": {
        "unverified": 9,
        "verified": 11,
        "certified": 14
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      "company_wide": null,
      "evidence_bar": "Autonomy architecture declared.",
      "applicability": "orbital servicing/inspection · lunar/planetary surface · ISS/crewed-platform internal · launch-support ground robotic
      "not_applicable_by_class": false
    },
    {
      "clause": "6.5",
      "id": "SPC-5",
      "name": "Radiation and thermal-cycle margins",
      "points_max": 14,
      "what_is_measured": "Dose budget vs mission; thermal-cycle fatigue margins; SEE mitigation.",
      "rungs": [
        {
          "points": 14,
          "state": "test data + margins published + independent review"
        },
        {
          "points": 12,
          "state": "pack-evidenced (documents), not demonstrated"
        },
        {
          "points": 10,
          "state": "test data"
        },
        {
          "points": 9,
          "state": "publicly evidenced only (no pack, no demonstration)"
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          "points": 6,
          "state": "margins declared"
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          "state": "not established"
        }
      ],
      "ceiling": {
        "unverified": 9,
        "verified": 12,
        "certified": 14
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      "company_wide": null,
      "evidence_bar": "Mission dose/thermal profile declared.",
      "applicability": "orbital servicing/inspection · lunar/planetary surface · ISS/crewed-platform internal · launch-support ground robotic
      "not_applicable_by_class": false
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    {
      "clause": "6.6",
      "id": "SPC-6",
      "name": "Single-point failure and redundancy analysis",
      "points_max": 12,
      "what_is_measured": "FMEA/FTA with redundancy for mission-critical functions.",
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```
      "rungs": [
        {
          "points": 12,
          "state": "independently reviewed"
        },
        {
          "points": 10,
          "state": "pack-evidenced (documents), not demonstrated"
        },
        {
          "points": 9,
          "state": "FMEA/FTA provided"
        },
        {
          "points": 8,
          "state": "publicly evidenced only (no pack, no demonstration)"
        },
        {
          "points": 5,
          "state": "summarised"
        },
        {
          "points": 0,
          "state": "not established"
        }
      ],
      "ceiling": {
        "unverified": 8,
        "verified": 10,
        "certified": 12
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      "company_wide": null,
      "evidence_bar": "None.",
      "applicability": "orbital servicing/inspection · lunar/planetary surface · ISS/crewed-platform internal · launch-support ground robotic
      "not_applicable_by_class": false
    },
    {
      "clause": "6.7",
      "id": "SPC-7",
      "name": "Programme support and ground-twin sustainment",
      "points_max": 8,
      "what_is_measured": "Multi-year ops support commitments, spares for ground twins, software maintenance horizon.",
      "rungs": [
        {
          "points": 8,
          "state": "commitments + record"
        },
        {
          "points": 7,
          "state": "evidenced by documents alone (public or pack), not demonstrated"
        },
        {
          "points": 6,
          "state": "commitments public"
        },
        {
          "points": 3,
          "state": "described"
        },
        {
          "points": 0,
          "state": "not established"
        }
      ],
      "ceiling": {
        "unverified": 7,
        "verified": 7,
        "certified": 8
```



```
      },
      "company_wide": {
        "text": "Company-wide → 6",
        "ceiling": 6
      },
      "evidence_bar": "None.",
      "applicability": "orbital servicing/inspection · lunar/planetary surface · ISS/crewed-platform internal · launch-support ground robotic
      "not_applicable_by_class": false
    },
    {
      "clause": "6.8",
      "id": "SPC-8",
      "name": "Mission anomaly record",
      "points_max": 8,
      "what_is_measured": "Anomalies/losses over prior missions.",
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        {
          "points": 8,
          "state": "none (model)"
        },
        {
          "points": 6,
          "state": "null-result rung"
        },
        {
          "points": 5,
          "state": "remediated"
        },
        {
          "points": 0,
          "state": "not established"
        }
      ],
      "ceiling": {
        "unverified": 6,
        "verified": 8,
        "certified": 8
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        "ceiling": 6
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      "evidence_bar": "None.",
      "applicability": "orbital servicing/inspection · lunar/planetary surface · ISS/crewed-platform internal · launch-support ground robotic
      "not_applicable_by_class": false
    }
  ],
  "pool": {
    "sector_only": {
      "points": 100,
      "ceiling_unverified": 70,
      "ceiling_verified": 85,
      "ceiling_certified": 100,
      "best_letter": {
        "unverified": "A",
        "verified": "AA",
        "certified": "AAA"
      }
    },
    "with_contributors": "contributor ceilings are those of the cited IR standards; the combined pool sums are verified by the conformance ga
  },
  "rules": {
    "no_evidence": "0 points (VRS-GEN-005 §6, R3.3); the criterion stays in the pool at full range",
    "not_applicable": "criterion removed from numerator and denominator for that class (VRS-GEN-006 §6)",
    "tier_rule": "AR tier ≤ IR tier (VRS-GEN-006 §7)"
  }
}
```


5 5 Field dictionary

FIELD	MEANING
`sector_criteria[].clause`	VRS-SPC-201 subclause (6.k) — the “Required by” reference used in derived packs and protocols
`sector_criteria[].points_max`	Upper end of the criterion’s integer range
`sector_criteria[].rungs[]`	Every verifiable state and its points, highest first; the 0 state is implicit where not listed
`sector_criteria[].ceiling`	Maximum points at each tier; always equal to a rung value (VRS-GEN-002 §7.5.1)
`sector_criteria[].company_wide`	Field-record criteria only: the reduced ceiling when company-wide data substitutes for model data
`sector_criteria[].applicability` / `not_applicable_by_class`	Application classes the criterion applies to; excluded criteria leave the pool for that class
`contributing_ir_criteria[]`	Intrinsic criteria counted in the sector pool, with the standard and clause that score them
`pool.sector_only`	Sums over the sector criteria and the best attainable letter at each tier (A / AA / AAA by construction)
`bands_percent`	Letter thresholds as a percentage of the applicable pool (VRS-GEN-006 §4)

6 6 Verification

Regenerate with `python3 tools/vrs-twin-generate.py --sector spc --check`; a non-zero exit means the committed twin no longer matches VRS-SPC-201 and shall be regenerated before publication.

7 Bibliography

- VRS-SPC-201, *Space — AR Assessment Protocol*, v1.0.0, 2026 — the source of every number in Clause 4.
- VRS-SPC-001, *SPC Sector Standard*, 2026 — sector scope, hazard taxonomy and application classes.
- VRS-GEN-005, *Intrinsic Rating — Methodology*, 2026 — point aggregation and tier ceilings for the contributing IR criteria.
- VRS-GEN-006, *Application Rating Scheme*, 2026 — letter bands and pool mechanics reproduced in `bands_percent` and `pool`.
- VRS-GEN-002, *Designation and Drafting Rules*, 2026 — §6.5 criterion layout and §7.5.1 (ceilings equal rungs) that this twin verifies.
- VRS-GEN-004, *Change, Edition and Review Policy*, 2026 — how a twin regeneration is designated.
- VRS-GEN-009, *Robot Risk Passport and Registry — Data Schema*, 2026 — consumer of the payload.
- ISO/IEC 21778:2017, *Information technology — The JSON data interchange syntax*.

8 Change history

VERSION	DATE	CHANGE
1.0.0 (draft)	2026-09-16	VRS 2026 (draft) rewrite: regenerated from VRS-SPC-201 Clause 5–7 (criteria, rungs, tier ceilings, contributors, bands, classes). Weights, modifiers, confidence and stage-`prior` fields removed.

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