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VRS-ASW-001

Assistive & Wearable / Exoskeleton Sector Standard

Application Rating requirements for human-attached robots — scope, device classes, hazards, and evidence; scoring is in VRS-ASW-201.

VEYRUM RESEARCH INSTITUTE

DOCUMENT	VERSION	STATUS	DATE
VRS-ASW-001	1.0	Draft	16 September 2026

Contents

> **Foreword.** Sector standard for the **Assistive & Wearable / Exoskeleton (ASW)** sector. The defining condition is **human attachment**: the robot is worn, so every failure is delivered directly to a human body and the "operating environment" is a person — the severity denominator is the wearer, not the platform's own value. The sector spans a verified **tri-regime split**: medical exoskeletons (IEC 80601-2-78 / medical-device law), physical-assistant robots (the ISO 13482 class), and industrial exoskeletons/exosuits (the ASTM F48 committee's domain). The clinical-evidence module applies to medical-class devices (Annex A). Anchors were verified against issuing-body pages on 2026-09-13 (Bibliography). Numeric thresholds are not set in this document; they live in VRS-ASW-201 and its data twin VRS-ASW-501, and are fitted to observed loss only via VRS-GEN-202. An Assistive & Wearable AR is an opinion above the compliance floor, not a certification; nothing here implies any real robot holds a Veyrum rating (ratings are not published). Requirements use "shall"; recommendations use "should".

1 1 Scope

This Standard defines the requirements for issuing an **Assistive & Wearable AR**: sector applicability and device classes (Clause 4), the sector hazard taxonomy (Clause 5), the rubric and grade bands (Clause 6), evidence requirements (Clause 7), the loss-driver mapping for insurance and finance fitness (Clause 8), protocol references (Clause 9), a worked applicability example (Clause 10), and the clinical-evidence module (Annex A). Its clauses follow the universal sector template (VRS-GEN-002 §6.4). The scoring mathematics are excluded (VRS-GEN-005/006; the sector's scoring content lives in VRS-ASW-201 with its data twin VRS-ASW-501).

It covers powered exoskeletons and exosuits (medical, assistive, and industrial) and comparable human-attached robotic devices worn on or coupled to the body.

Boundary with adjacent sectors and regimes (per the IEC 80601-2-78:2019 exclusion list): external limb prosthetics (ISO 22523 regime) and electric wheelchairs (ISO 7176) are out of VRS scope in v1; non-attached rehabilitation robots are rated under **VRS-MED-001**; non-attached personal-care robots are rated under **VRS-SVC-001** or **VRS-DOM-001**. Robot form is not a sector (VRS-GEN-001 §3.4.3): rigid exoskeletons and soft exosuits are both rated under ASW by this Standard when the Clause 4 human-attachment condition holds.

2 2 Normative references

The documents below constitute requirements of this Standard where cited. VRS documents are dated at the point of assessment unless stated otherwise.

- **VRS-GEN-001**, Vocabulary; **VRS-GEN-005**, IR Methodology; **VRS-GEN-006**, AR Scheme; **VRS-GEN-007**, Sector Classification; **VRS-GEN-009**, Passport & Registry Schema; **VRS-GEN-012**, Evidence & Data Requirements (evidence grades).
- **VRS-ASW-201**, Assistive & Wearable AR Assessment Protocol (scoring; dated at assessment); its data twin is **VRS-ASW-501**.

- **VRS-GEN-202**, Calibration & Validation (constant fitting); **VRS-MED-001** Annex B (clinical-evidence module, applied to the medical device class).
- Anchor regime (verified 2026-09-13) — anchors and evidence lanes, **not** conformity floors VRS re-certifies (VRS-GEN-001 §3.5.1); the ISO 8373:2021 term basis is cross-referenced in Clause 3. The tri-regime split:
  - **Medical class: IEC 80601-2-78:2019 + AMD1:2024** — basic safety and essential performance of medical robots for rehabilitation, assessment, compensation or alleviation (FDA-recognized), placed on market under medical-device law (**Regulation (EU) 2017/745**, MDR; or FDA clearance). The VRS-MED-001 clinical machinery applies (Annex B). An **IEC/DIS 80601-2-78 revision is in circulation**; the edition current at assessment applies.
  - **Personal-assistance class: ISO 13482:2014**, safety requirements for personal care robots (physical-assistant-robot category), with its safety-related test methods **ISO/TR 23482-1:2020** and application guidelines **ISO/TR 23482-2:2019**. A revision (**ISO/DIS 13482**, retitled *Robotics — Safety requirements for service robots*) is in progress; re-date at assessment.
  - **Industrial/occupational class: ASTM F48** committee standards for exoskeletons and exosuits (committee formed 2017), including **ASTM F3474-20** (functional ergonomic parameters and test metrics) and **ASTM F3358-20** (ergonomic guidelines); the specific designations current at assessment are recorded then.

3 3 Terms and definitions

For the purposes of this Standard, the terms in VRS-GEN-001 (aligned to ISO 8373:2021) apply, together with the following local terms:

- **device class** — a declared category of assessed human-attached device; at minimum one of `medical-exoskeleton`, `personal-assistance`, `industrial-exoskeleton` (VRS-ASW-001 §4.3), each mapped to the anchor regime whose floor it requires (Clause 2).
- **attachment interface** — the physical human–device coupling through which loads are delivered.
- **biomechanical load** — the forces and torques delivered through the wearer's body, expressed in newton-metres (N·m) for joint torque and newtons (N) for interface loading.
- **doffing time** — the time to remove the device, powered or unpowered, in an emergency, measured in seconds (s).
- **wearer population** — the human population a device class is declared for, including any vulnerable or dependent population (e.g. post-injury patients, older adults, children); the severity-weighting attribute for on-body injury.
- **wearer-hours** — observed hours a model is worn by a human wearer within its assessed envelope; the ASW frequency/reliability exposure denominator (measured in hours), owned by VRS-ASW-201 §8.1.
- **exposure-envelope attributes** — recorded per device class, not denominators: don/doff cycle counts, body-region coverage, skin-contact temperature (in degrees Celsius, °C), and the declared wearer population.

4 4 Sector applicability and device classes

4.1 ASW is an **intended-use sector** (VRS-GEN-007 §5.2). Applicability shall follow the standard determination: a manufacturer declaration of a human-attached intended use, or an assessor override with recorded rationale (VRS-GEN-006 §5.2). Default: not-applicable, displayed "—", never a letter.

4.2 Minimum capability: a model in scope shall provide **safe attachment to and detachment from a human wearer**, including **unpowered emergency removal**. A model that cannot be removed without power in an emergency shall record the limitation and shall not clear hazard group H2 (Clause 5) on a powered-doffing pathway alone.

4.3 The assessed envelope shall state the **device classes** covered — at minimum one of `medical-exoskeleton`, `personal-assistance`, `industrial-exoskeleton` — recorded as protocol applicability fields (VRS-GEN-007 §4.2). The device class determines which anchor regime's floor applies (Clause 6).

4.4 Each declared device class shall carry its **exposure envelope**: the declared wearer population, the body regions coupled, don/doff cycle counts, skin-contact temperature limit (°C), and the wearer-hours accrued (VRS-ASW-201 §8.1). The AR letter shall cover only the assessed classes and wearer populations; unassessed classes shall be displayed as *not covered*.

4.5 Where evidence diverges materially between device classes, letters shall be issued **per device class**, and the displayed sector letter shall be the **lowest issued class letter** (VRS-ASW-201 §4.3), so that a stronger class cannot mask a weaker one.

5 5 Sector hazard taxonomy

The Assistive & Wearable AR shall weigh, at minimum, the following hazard groups. Each maps to the IR categories (VRS-GEN-005 §5) it draws evidence from and to its dominant loss driver; the sector emphasis (weights) is defined in VRS-ASW-201, not here.

#	HAZARD GROUP	ARCHETYPE	PRIMARY IR CATEGORIES	LOSS DRIVER
H1	Biomechanical injury	joint over-torque; misalignment loading; fall-with-device dynamics	safety_incidents	severity (bodily injury), frequency
H2	Attachment and egress	failure to doff in emergency; entrapment; interface pressure injury	safety_incidents, serviceability	severity multiplier
H3	Wearer-state mismatch	device acting against wearer intent (spasticity, stumble response); fatigue-state misjudgement	safety_incidents, spec_integrity	frequency, severity
H4	Power and actuation	battery failure worn on the body; actuator runaway/lock; thermal exposure at the skin	safety_incidents, reliability	frequency, severity
H5	Wearer data	gait/health-adjacent telemetry; account and firmware compromise	cyber_posture	correlated/cyber-catastrophe, severity
H6	Fit and support lifecycle	per-wearer fitting-quality dependence; long-term device support for dependent users	manufacturer_support, serviceability	frequency, obsolescence

5.1 The hazard taxonomy shall be treated as the minimum coverage set: an assessment that omits a hazard group applicable to the declared device classes shall record the omission and its reason.

5.2 H1 (biomechanical injury) and H4 (power and actuation) are the sector-defining loss drivers: because the operating environment is a person, severity shall be weighted against the declared **wearer population** — including any vulnerable or dependent population — and shall be evidenced from instrumented biomechanical and on-body power/thermal testing (joint torque in N·m, skin-contact temperature in °C), not inferred from an unrelated class or wearer population.

5.3 For any class declared for a vulnerable or dependent wearer population, H1 and H2 evidence shall include instrumented testing representative of that population; bench evidence on a mannequin alone shall not clear H1 or H2 for that class, and wearer recollection of a biomechanical event shall not be admissible as H1/H2 evidence (VRS-ASW-201 §7.3).

5.4 H2 (attachment and egress) severity shall rest on a measured **emergency doffing time** (in seconds) for both powered and unpowered removal; a bare declaration of removability shall not clear H2. H5 (wearer data) shall not be scored from transferred evidence where the assessed class introduces a new account, firmware or telemetry plane.

6 6 Rubric and grade bands

6.1 The Assistive & Wearable AR is determined per **VRS-ASW-201** from the criterion pool defined there; letters follow **VRS-GEN-006 §4** on the canonical scale (C < B < A < AA < AAA; VRS-GEN-001 §3.1.3), with the AAA band reserved headroom (deliberately hard, anti-inflation). No threshold, ceiling, or point value is set in this document; sector priors are held and fitted only in the VRS-ASW-501 twin (VRS-GEN-202).

6.2 Anchor and regulatory-clearance conformity — medical-device clearance under IEC 80601-2-78:2019

- AMD1:2024 within an FDA or Regulation (EU) 2017/745 pathway for the `medical-exoskeleton` class, ISO 13482:2014 conformity (with the ISO/TR 23482-1:2020 test methods) for `personal-assistance`, and applicable ASTM F48 conformity (e.g. ASTM F3474-20) for `industrial-exoskeleton`, or a recorded jurisdictional equivalent — is scored by **VRS-ASW-201 §6.1** as criterion **ASW-1**, a per-class rung carrying a large point range, not a gate. Absence of evidenced clearance or conformity scores zero on ASW-1 for that class and the model is still rated; a rating is an opinion on the robot, not on the lawfulness of any deployment. The reader of the earlier per-class regulatory-clearance gate and conformity cap finds both here, as ASW-1. A mandatory adverse-event registry search (Annex A) shall be recorded before any medical-class letter.

7 7 Evidence requirements

7.1 Evidence shall be graded per VRS-GEN-012. Sector-relevant sources include instrumented biomechanical test evidence, wearer-hours by device class, injury and adverse-event records, emergency-doffing test results (in seconds), on-body battery/thermal-safety test files, per-wearer fitting and support records, and (for the medical class) regulatory clearance and adverse-event registry-search records. The clinical-evidence module rules apply to the medical class (Annex A).

7.2 For each hazard group, an existing conformity or operational artefact should be mapped to the VRS evidence lane so that adoption costs a manufacturer a mapping rather than new testing:

HAZARD	EXISTING ARTEFACT (EXAMPLE)	VRS EVIDENCE LANE
H1	Instrumented biomechanical test report (joint torque N·m, alignment loading, fall-with-device dynamics); IEC 80601-2-78:2019 + AMD1:2024 essential-performance test file (medical); ASTM F3474-20 functional ergonomic parameters (industrial); ISO/TR 23482-1:2020 test methods (personal-assistance)	safety_incidents
H2	Emergency-doffing test report (powered and unpowered doffing time in seconds); attachment-interface pressure-injury assessment; entrapment/egress trial for the declared wearer population	safety_incidents, serviceability
H3	Wearer-intent/response test evidence (stumble, spasticity, fatigue-state handling); spec-integrity verification record	safety_incidents, spec_integrity
H4	On-body battery and thermal-safety test file (worn-cell safety; skin-contact temperature °C); actuator runaway/lock FMEA	safety_incidents, reliability
H5	IEC 62443-4-2:2019 (+COR1:2022) SL-C evaluation (FR1–FR7) of the account/firmware/telemetry plane; data-protection impact assessment for gait/health-adjacent telemetry	cyber_posture
H6	ISO 14224:2016 maintenance records (active repair time; parts-delay in days); manufacturer support declaration with end-of-support date (months); per-wearer fitting/re-fit procedure	manufacturer_support, serviceability

7.3 Evidence sufficiency for each criterion is the criterion's evidence bar defined in VRS-ASW-201 and graded per VRS-GEN-012 §4. Where a model×class lacks the wearer-hour history or wearer-context observations to meet a criterion's evidence bar, that criterion is scored on the evidence available and the model×class is still rated; company-wide evidence may substitute under the cold-start parity rule of VRS-GEN-005 §6, and thresholds are held only in VRS-ASW-501.

7.4 Where H1, H2 or H4 evidence rests on manufacturer declaration alone, without an instrumented test report, the criterion shall be scored no higher than its Unverified-tier ceiling (VRS-ASW-201 Clause 8) and the assessment shall record the evidence gap. Uninstrumented wearer recollection shall be inadmissible for H1/H2 (§5.3, VRS-ASW-201 §7.3).

8 8 Loss-driver mapping (insurance and finance fitness)

8.1 Every quantity that feeds the ASW rating shall be traceable to a loss driver and to a Robot Risk Passport field (VRS-GEN-009), so that an underwriter or lender can compute it from obtainable evidence. The mapping is:

LOSS DRIVER	ASW SIGNAL	EXPOSURE DENOMINATOR	CONSUMES
Frequency	H1 biomechanical events; H4 on-body power/actuation failures; H3 wearer-state mismatches	per 1,000 wearer-hours	safety_incidents, reliability
Severity	H1 bodily-injury; H2 failure-to-egress consequence; H4 skin thermal injury	per event, weighted by declared wearer population	safety_incidents
Exposure	wearer-hours accrued in the declared device class	wearer-hours	reliability
Recoverability	device write-off vs. repair after an incident	per event	serviceability
Residual value / obsolescence	biomechanical-load and actuation wear; end-of-support horizon (months)	per model	economics_residual, manufacturer_support
Correlated / cyber-catastrophe	H5 shared account/firmware/telemetry plane across a fleet	per fleet	cyber_posture

8.2 An ASW signal that lacks an exposure denominator shall not be scored as a frequency; it shall be recorded as a descriptive attribute or elevated as a design question (VRS-GEN-202). No loss statistic shall be invented to fill a missing denominator.

8.3 On-body bodily-injury severity is the finance- and insurance-risk driver unique to this sector: because the operating environment is a person, a single failure is delivered directly to a human body and can generate a bodily-injury claim far exceeding the unit’s own value. The declared wearer population and the measured biomechanical load shall be surfaced as passport attributes so an underwriter can read the severity floor from the wearer, not from the device value, and weight bodily-injury severity independently of frequency.

8.4 Emergency egress is a severity multiplier: the measured emergency doffing time (in seconds, powered and unpowered) shall be surfaced as a passport attribute so an underwriter can distinguish a device a wearer can shed quickly from one that concentrates entrapment severity.

8.5 Correlated and cyber-catastrophe accumulation (H5) shall be surfaced as a passport-recorded attribute: where many units of a model share one account, firmware or telemetry plane, one adversary action or one defective update can degrade or capture the fleet at once, so the risk does not diversify the way independent mechanical failures do. The attribute shall record whether that plane holds an IEC 62443-4-2:2019 SL-C evaluation, so an underwriter can set a per-fleet accumulation cap. This attribute is descriptive, not scored, until a fleet-loss denominator exists (VRS-GEN-202 §8).

8.6 The rating output shall be expressed so that it can feed an underwriting decision (rate relativity, deductible, exclusion, condition) or a credit decision (loan-to-value, residual curve, covenant); the letter alone is insufficient, and the tier, edition and evidence-basis flags shall accompany it in the Passport record. The C6 end-of-support horizon (in months) informs the obsolescence assumption, which is acute for a device a dependent wearer relies on daily.

9 9 Protocol references

- **VRS-ASW-201** — Assistive & Wearable AR Assessment Protocol (scoring) — dated reference at assessment time; its data twin is **VRS-ASW-501**.
- Assistive & Wearable Test Protocols (`VRS-ASW-1xx`) are reserved; the first candidates are an emergency-doffing protocol (powered and unpowered doffing time under load) and a fall-with-device behaviour protocol, drawing on the ISO/TR 23482-1:2020 and ASTM F3474-20 methods rather than duplicating them.

10 10 Worked example (informative) — applicability walkthrough

The following illustrates how an assessor applies Clauses 4–8 to a **hypothetical** model; it is not a real assessment and does not imply any robot holds a Veyrum rating.

Input. A manufacturer declares a powered lower-limb rehabilitation exoskeleton, model code `ASW-RX-01` , for one device class, `medical-exoskeleton` , for a wearer population of adult post-stroke gait-rehabilitation patients under clinician supervision. It holds an IEC 80601-2-78:2019 + AMD1:2024 essential-performance test file within a cleared Regulation (EU) 2017/745 pathway, an instrumented biomechanical test report, an emergency-doffing test report (unpowered doffing time 9 s), an on-body battery/thermal-safety file (skin-contact temperature within limit), ISO 14224:2016 maintenance records, and an IEC 62443-4-2:2019 SL-2 evaluation of its telemetry plane. It has accrued 12,000 wearer-hours with 2 recorded minor biomechanical events and 0 serious injuries.

Step 1 — applicability and device class (Cl. 4). The device is human-attached and removable without power, so 4.1–4.2 are met; the manufacturer declaration makes ASW applicable. The envelope records the class `medical-exoskeleton` with its exposure envelope (declared wearer population, body regions, don/doff counts, skin-contact temperature limit, and 12,000 wearer-hours per 4.4).

Step 2 — hazard coverage (Cl. 5). H1–H6 all apply. H1 rests on the instrumented biomechanical report for the declared adult supervised population (5.2/5.3, no mannequin-only inference); H2 rests on the measured 9 s unpowered doffing time (5.4, no bare declaration).

Step 3 — ASW-1 conformity (Cl. 6.2). The class is `medical-exoskeleton` ; a cleared IEC 80601-2-78 / EU MDR pathway and an on-file adverse-event registry search exist, so ASW-1 scores on the top rung for that class (had clearance been absent, ASW-1 would score zero for the class and the model would still be rated).

Step 4 — evidence bar (Cl. 7.3). 12,000 wearer-hours with 2 biomechanical events are checked against each criterion's evidence bar in VRS-ASW-201; assume the instrumented reports and wearer-hours

meet the H1/H2/H4 bars, so those criteria score at their evidenced tier rather than on manufacturer declaration alone.

Step 5 — loss-driver read (Cl. 8). Biomechanical-event frequency is expressed as 2 events per 12,000 wearer-hours = 0.17 per 1,000 wearer-hours (H1). On-body severity (8.3) is read from the declared adult supervised wearer population and the measured biomechanical load, not from the device value. The 9 s unpowered doffing time is surfaced as the egress severity-multiplier attribute (8.4). The device shares a telemetry plane with an SL-2 (not SL-C) evaluation, so 8.5 records the accumulation attribute below the target level.

Output. The rating is computed by VRS-ASW-201 (not in this document). The Passport record carries the class letter, the device class and wearer population, the exposure envelope, the tier and edition, the H1/H4 evidence notes, the doffing-time and accumulation attributes, and (for the medical class) the regulatory pathway identifier and the adverse-event registry-search record. The numeric score and band boundary come from VRS-ASW-501 priors and are not asserted here.

Industrial variant. Had `ASW-RX-01` instead been an `industrial-exoskeleton` shoulder-support exosuit holding **no** ASTM F48 (e.g. ASTM F3474-20) conformity evidence, ASW-1 (6.2) would score zero for that class; the class is still rated and the missing conformity lowers the pool total, not a hard letter.

No-conformity variant. Had the medical device lacked a cleared regulatory pathway, ASW-1 (6.2) would score zero for the class and the model would still be rated; a rating is an opinion on the robot, not on the lawfulness of any deployment. Where the wearer-hours fell below a criterion's evidence bar, that criterion is scored on the evidence available (7.3), not withheld. Numbers illustrate mechanics only.

11 Annex A (normative) — Clinical-evidence module (medical class)

For a `medical-exoskeleton` class, VRS-MED-001 Annex B applies in full: regulated-context admissibility, a mandatory adverse-event registry search recorded before any medical-class letter, de-identification of clinical evidence, and recording of the regulatory pathway identifier. No personal information shall be stored (VRS-GEN-012 §5.2), and gait/health-adjacent telemetry shall be de-identified.

12 Bibliography

- IEC 80601-2-78:2019 + AMD1:2024, Medical electrical equipment — Part 2-78: medical robots for rehabilitation, assessment, compensation or alleviation (webstore.iec.ch publication 69618; CSV 93014; iso.org/standard/90453.html, 68474, 83341; FDA recognized) — medical-class floor; its exclusion list defines the sector boundary (prosthetics → ISO 22523; wheelchairs → ISO 7176; personal-care robots → ISO 13482). IEC/DIS 80601-2-78 revision in circulation.
- ISO 13482:2014, Robots and robotic devices — Safety requirements for personal care robots (iso.org/standard/53820.html); under revision as ISO/DIS 13482, retitled *Robotics — Safety requirements for service robots* (iso.org/standard/83498.html, 2024/25 draft) — personal-assistance floor; re-date when it publishes.
- ISO/TR 23482-1:2020 (safety-related test methods; iso.org/standard/71564.html) and ISO/TR 23482-2:2019 (application guidelines; iso.org/standard/71627.html) — informative test-method

companions to ISO 13482; H1 test source.

- ASTM F3474-20, Standard Practice for Establishing Exoskeleton Functional Ergonomic Parameters and Test Metrics, and ASTM F3358-20, ergonomic guidelines (ASTM F48 committee, formed 2017; revision WK95133 in progress) (astm.org) — industrial/occupational-class H1 evidence lane.
- Regulation (EU) 2017/745 (Medical Device Regulation), 5 April 2017, date of application 26 May 2021 (eur-lex.europa.eu/eli/reg/2017/745) — medical-class market law alongside FDA recognition.
- IEC 62443-4-2:2019 (edition 1.0; COR1:2022), technical security requirements for IACS components (SL-C against FR1–FR7) (webstore.iec.ch/publication/34421) — H5 wearer-data/telemetry lane.
- ISO 14224:2016, Collection and exchange of reliability and maintenance data for equipment (iso.org/standard/64076.html) — H6 reliability and support lane.
- ISO 8373:2021, Robotics — Vocabulary, Edition 3 (iso.org/standard/75539.html) — robot-term basis.
- VRS framework research Phase 5 (internal) — ASW scan (human-attached injury profile).

13 Change history

DATE	VERSION	STATUS	CHANGE	AUTHORITY
2026-09-05	0.1	Draft	Initial draft — final active sector; tri-regime split (medical/personal/industrial) with per-class floors; prosthetics + wheelchairs descoped per IEC 80601-2-78 exclusions	CEO goal 2026-09-05
2026-09-12	0.1ε1	Draft	COHERENCE: retired 3 bare `CALIBRATION-PENDING` markers (Foreword, §6.1, §6.2 cap placement) → VRS-GEN-202 stage `prior` labels, matching the GEN-005 (Run #31)/FLD-001 (Run #39) precedent. Editorial only — no constant, threshold, cap, or requirement changed.	Curator Run #55; charter COHERENCE
2026-09-16	1.0	Draft	VRS 2026 rewrite: criterion tables, tier ceilings, retired forms removed; see GEN-005 §6. §6.1 recast to point at VRS-ASW-201 + GEN-006 §4; §6.2 medical no-clearance gate and §6.3 personal/industrial conformity cap folded into criterion ASW-1 (VRS-ASW-201 §6.1) — absence of clearance/conformity scores zero, robot still rated; §6.4 (GEN-201 cold-start) deleted; §2 dropped the VRS-GEN-201 reference; §7.3/§7.4 re-expressed on the evidence bar / tier (Unverified ceiling) instead of the confidence band and assessed-unrated/cold-start; §8.6 confidence band → tier+edition; §10 worked example re-run on ASW-1 and evidence bars (no-conformity + industrial variants score zero, still rated); Annex A (cold-start particulars) deleted; clinical-evidence module renumbered Annex B→A. No hazard, anchor, or evidence-lane content changed; ASW-501 twin regenerated by the dispatcher. Net 3,839→3,751 words; shall 56→40.	Curator REWRITE; vrs-rewrite-instructions-v1 §5.3

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