

Below is included a brief detail of the tailoring process and three different tailoring examples (Tailored requirements, NEW requirements, and non-applicable requirements) that document the process of tailoring. All three examples are taken from AFSPCMAN 91-710 Volume 3, 2019.

### **Tailoring Brief**

The AFSPCMAN 91-710 safety requirements provides for a contractual-like agreement between the US Space Force and the Range User on specific safety requirements that are established for the life of the program. The Tailoring process provides a means for formulating a specific edition of AFSPCMAN 91-710 (referred to here on out as this publication), incorporating only those requirements applicable to a particular Range User program. Additionally, the tailoring process documents “*whether or not*” the Range User will meet the requirements as written, or achieve an Equivalent Level of Safety (ELS) through an acceptable alternative. Requirements of this publication are subject to tailoring within limits.

The purpose of tailoring the publication is to ensure that only applicable requirements are identified and to determine whether or not the requirement will be met as written, or through an alternative means that will provide an ELS.

The FAA shall be included in the tailoring process for licensed or permitted programs at AFSPC ranges per the memorandum of agreement between HQ USSF and the FAA/AST on Resolving Requests for Relief from Common Launch Safety Requirements (Ref. Volume 1, section 4.4).

Although the tailoring may reference waivers, waivers shall be approved through a separate waiver process, as no requirement can be waived during the tailoring process. When a requirement is not met, the Range User can submit a noncompliance requests. Details and requirements for submitting noncompliance request(s) can be found in Volume 1, Attachment 4.

An approved tailoring proposal commonly results with the three following situations:

1. A requirement is determined to be not applicable to the systems and or operations.
2. A requirement is modified based on an ELS which meets the intent of the original requirement.
3. A new requirement is added based on new technologies, propellants, materials, and/or processes.

For the case of an ELS, the Range User is required to submit a detailed rationale behind the intent of their proposed tailoring and should clarify how they maintain an ELS with meeting the intent of the requirement. This will require an associated hazard analysis determining the ELS. Upon receipt of a Range User tailoring proposal, Range Safety will evaluate the proposal for determining if an ELS is met by a potential system against all performance requirements. A change is allowed to tailor the requirement to a particular system/operation as long as the intent of the requirement is met and the ELS is maintained.

Similarly, an evaluation for non-applicable requirements will be verified and in the case of new requirements, Range Safety will evaluate the proposal on levels of safety against performance requirements.

Each AFSPCMAN 91-710 [T] shall contain a preface paragraph detailing the critical assumptions that were made in writing the tailored edition. The nature of the assumptions shall be such that a change in assumptions may invalidate the AFSPCMAN 91-710 [T] or require a change or update. The assumption(s) described in the Tailoring Request form shall include sufficient detail to categorize the scope of the tailored requirement to the specific systems or subsystems affected by the proposed change.

If two or more systems/subsystems are affected by the tailored paragraph, then the assumption(s) shall state which of those systems/subsystems is intended to be included in the scope of the tailoring. If there is a difference in the tailoring for the two or more systems/subsystems, then the tailored paragraph shall be repeated with appropriate tailoring unique to each individual system/subsystem. All changes shall be highlighted in bold. Deletions of text, including partial deletions, shall be shown with the original text marked with strikethrough. Insertions of text, including partial insertions, shall be shown with the new text marked with underline.

Technical Interchange Meetings (TIMs) are required for Range Users to present their systems to Range Safety and to participate in the active tailoring of the publication. TIMs shall be scheduled as early in the program as possible when program definition is sufficient. AFSPCMAN 91-710 [T] TIM data shall be provided to Range Safety at least 30 days before scheduled TIMs unless otherwise agreed to.

The forms for submitting Tailoring Requests are available from the Range Safety offices. (See examples below.) During the TIM process, through dialog and negotiation, Range Safety will comment on the proposed change and dispose of it as “approved as written,” “approved with provided comments,” or “disapproved.”

Please reference Volume 1, Section 4.4 and Attachment 2 for further details on the AFSPCMAN 91-710 Tailoring Process.

### **Tailoring Examples**

Guidance for Tailoring is given in AFSPCMAN 91-710 Volume 1, Attachment 2. The tailoring follows the volume requirement paragraph format with the following columns:

<u>Column</u>	<u>Title</u>
1	Paragraph #
2	Original Language
3	Code
4	Tailored Language
5	Tailoring Rationale
6	Range Safety Comment

**Note:** the Code is either (I) Information, (C) Comply, (T) Tailored, (N/A) Not Applicable, (NEW) New Requirement, or Non-Compliance [(MIC) Meets Intent Certification, (D) Deviation, (W) Waiver]

In the examples below the Range User provides their recommendations for tailoring and their rationale on equivalent level of safety for Tailored requirements. In the last column, Range Safety would provide comment on concurrence, or non-concurrence of the Tailoring.

Tailoring Example 1. Piping Inspection

Paragraph	Original Language	Code	Tailored Language	Tailoring Rationale	Range Safety Comments
11.2.2.7	11.3.2.7. Ground Support Pressure System Tubing. Tubing connections can be of a butt-weld type or by use of precision 37-degree fittings. <b>Note:</b> For welded connections, pneumatic distribution tubing should be annealed seamless, stainless steel type 304/304L or 316/316L.	C			
11.2.2.7.1	11.3.2.7.1. If 37-degree flared end fittings are used, they shall be designed IAW precision type AN, MS, or KSC-GP-425, <i>Engineering Standards</i> , standards. <b>Note:</b> The material used to join 37-degree flared end fittings should be type 316 stainless steel.	C			
11.2.2.7.2	11.3.2.7.2. If butt-weld fittings are used to join tubing, they shall be designed in accordance with KSC-GP-425 or equivalent. <b>Note:</b> The material should be type 304L or 316L stainless steel.	T	If butt-weld fittings are used to join tubing, they shall be designed in accordance with <b>KSC-GP-425 B31.3 Process Piping</b> or equivalent. <b>Note:</b> The material should be type 304L or 316L stainless steel.	Range user is a commercial company and KSC standards do not apply.	

<p>11.2.2.7.3</p>	<p>11.3.2.7.3. All tubing and butt-weld fitting welds shall be 100% radiographically inspected. Acceptance and rejection criteria shall be IAW Table 341.3.2 of ASME B31.3.</p>	<p><b>T</b></p>	<p>All tubing and butt-weld fitting welds shall be 100% <u>visually inspected and radiographically radiography of a random 5% of the system/lot. If the inspector rejects a radiograph of one weld from a lot, radiographs of two more welds must be done. Rejection of one of these two radiographs requires radiographs of two more welds. If one of these two radiographs is rejected, radiographs of all the welds in the lot must be done-inspected.</u></p> <p>The accept and reject criteria shall be IAW Table 341.3.2 <u>and Table K341.3.2</u> of ASME B31.3.</p>	<p>Range user is a commercial company and would like to adhere to ASME B31.3 requirements. This is common practice in the industry and provides the appropriate equivalent level of inspections and safety.</p>	
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Tailoring Example 2. New Requirements

Paragraph	Original Language	Code	Tailored Language	Tailoring Rationale	Range Safety Comments
12.11		I	<u>(NEW) Flight Hardware 3D Printed Pressurized Structure Analysis and Test Requirements.</u>	Range User is utilizing 3D printed pressurized structures/vessels; therefore, this new section addresses safety-related requirements resulting from utilizing new manufacturing technology.	
12.11.1		C	<u>(NEW) Additional Requirement</u>	Additional rationale for requirement	
12.11.2		C	<u>(NEW) Additional Requirement</u>	Additional rationale for requirement	

Tailoring Example 3. Non-Applicable Requirement

Name	Original Language	Code	Tailored Language	Tailoring Rationale	Range Safety Comments/Approval Status
18.1	<b>General.</b> In addition to the requirements in Chapter 6 and Chapter 13 of this volume, the following data and analysis shall be provided for solid rocket motors and rocket motor segments:	N/A		Range User program does not use Solid Rockets.	
18.1.1	Structural analyses for all aerospace ground equipment used to handle rocket motors and segments. This includes items such as handling rings, special breakover fixtures, air pallets, segment and motor stands, special lifting fixtures, and critical motor component installation fixtures.	N/A		Range User program does not use Solid Rockets.	
18.1.2	Initial and periodic NDE plans for the aerospace ground equipment, as required in 6.1.1.3.2.1. Single failure items and SFP welds shall be clearly identified.	N/A		Range User program does not use Solid Rockets.	
18.2	<b>FMECA and OHA.</b> FMECA and operational hazard analysis (OHA) for all aspects of solid rocket segment and/or motor handling and buildup. This analysis shall include the following:	N/A		Range User program does not use Solid Rockets.	
18.2.1	An assessment of the probability of the motor or segment igniting and possibly becoming propulsive upon mechanical, electrical, or thermal shock.	N/A		Range User program does not use Solid Rockets.	

Tailoring Example

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Name	Original Language	Code	Tailored Language	Tailoring Rationale	Range Safety Comments/Approval Status
18.2.2	An assessment of the requirements for onsite NDE testing of rocket motor segment and/or motors. X-ray or ultrasonic testing equipment failure modes, and their effect on the rocket motor/segment shall be analyzed. This analysis is particularly important for equipment used to inspect rocket motor bore.	N/A		Range User program does not use Solid Rockets.	
18.3	<b>Lightning Effects Hazard Analysis.</b> For solid rocket segment/motor processing and storage facilities, a lightning effects hazard analysis that analyzes the effects of a lightning strike on the rocket motor segments and/or motors inside these facilities shall be performed. This analysis shall specify operational restrictions; in other words, no lifting or handling of segments or motors during lightning advisory periods.	N/A		Range User program does not use Solid Rockets.	
18.4	<b>Solid Rocket Motor and Motor Segment Data Requirements.</b> The data requirements found in Attachment 2, A2.2.4.9.6 shall be submitted for solid rocket motors and motor segments.	N/A		Range User program does not use Solid Rockets.	