

# Certification Related Issues for Next Gen Tech

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## BACKGROUND

New age companies like NewSpace Research & Technologies, aim to usher in a disruption in the type of platforms that are used by our armed forces, based upon a range of new technologies that are currently ready to move out of the laboratory and be fielded in operational systems. The primary focus is on the introduction of new gen technologies (aerial robotics including robotic vision, Artificial Intelligence, edge computing for autonomy, mesh networks) alongside a revamp of doctrines for weapon employment (disaggregation of capabilities, swarming, autonomy, democratisation of aviation, etc.). So far, this endeavour has been aided by the absence of overly specific rules/constraints other than some reasonably common sense guidelines (like ‘man on the loop’ for weapons employment, etc.). However, it is but a matter of time before a detailed rule-based framework is created and adopted. This commentary is an attempt to ensure that right balance is struck when these rules are framed.

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## PERCEPTIONS OF CERTIFICATION UTILITY

In general, certification is a little understood term in the Indian context. On the one hand, it is invoked as a panacea for all developmental and production problems and, therefore, invoked without regard to the costs involved, or effect on the system performance sought. One such example is the recent change in the Defence Acquisition Procedure (DAP) to require 'full certification' at the stage of SSCT for Make-2 programmes instead of accepting provisional clearance sufficient to permit a practical evaluation. At this stage, all the investment has been funded solely by the developer, and there is still no firm order for the product; hence insistence on a full certification is completely unnecessary, and will certainly serve as a major deterrent to innovation.

On the other hand, the certification process is perceived by some as too bureaucratic, and hence all attempts are made to avoid the involvement of certification agencies to the extent possible. Obviously, both extremes are inappropriate and detrimental to all parties.

### DRAFT 'INDIAN MILITARY AIRWORTHINESS BILL 2024'

The release of Indian Military Technical Airworthiness Requirements (IMTAR) did not impact anything adversely because it basically spoke only about the process, without any added restrictions in the rules to be followed. However, the current process to introduce legislation in the form of the 'Indian Military Airworthiness Bill 2024' has had a chilling effect with its criminal law vocabulary. More worrying are the undertones of mistrust, particularly towards indigenous private industry. While essentially leaving foreign Original Equipment Manufacturers (OEMs) and Defence Public Sector Undertakings (DPSUs) out of its scope, it will end up criminalising even failure to meet the customer's requirements. While such failure is undoubtedly a breach of contract, and is already liable to contractual penalties, criminalising it is clearly gross over-reach. The draft law also envisages the deeply intrusive involvement of certification agencies in the development processes.

Most importantly, while it spells out in detail the process to be followed in the case of the violation of the rules, it is silent on what exactly the rules to be followed are. It can be reasonably expected that these rules will be replications of foreign standards, like the ubiquitous 'mil-standards', as we neither have any indigenous standards/specifications of our own, nor the huge research infrastructure required to formulate these independently. The worst-case outcome would be if a superset of all global standards is

adopted for enforcement, that is, JSSGs, Mil Stds, Def Stans, STANAGs, GoST, etc. If so, this would be a grave misapplication as the source standards were not written from a criminal law perspective. Instead, they represent accumulated engineering wisdom, consolidated to guide specific generations of equipment types to which they are applicable. As such, any new types of equipment have to be permitted the freedom to recast the standards as has been the actual history and intent of these standards in the first place. For example, the introduction of fly-by-wire led to the development of a whole new mil-std family. In fact, many of the later standards incorporate fill-in-the-blanks type prescriptions and are, thus, merely logic frameworks rather than enforceable laws. The harsh implementation of standards written for a previous generation of equipment, without adaptation to new technologies, would be an engineering distortion, and completely kill any hope of product innovation.

The whole segment of the draft bill relating to ‘continuing airworthiness’ seems to be misdirected. At this stage, the platforms belong to the customer who is, in any case, outside the jurisdiction of the Centre for Military Airworthiness & Certification (CEMILAC) or the Directorate General of Aeronautical & Quality Assurance (DGAQA). Over half of the draft bill relates to ‘continuing airworthiness in service’, yet the language is still aimed largely at the developer. Thus, any delay in the incorporation of modifications is deemed a violation of the rules, and is liable to penalties. This construct ignores the basic nature of modifications, which is that they are developed either suo-moto as product enhancements, or in response to specific requests from a customer. The customer already owns the basic equipment which is to be upgraded and, hence, the developer cannot undertake modifications without specific permissions/requests from the customer. Either way, they are to be purchased by the customer as desired and, hence, it is only he who decides the pace of their implementation. Holding the developer responsible for their timely implementation seems thoroughly misdirected. Similarly, the rest of the provisions relating to the operation of the equipment are also not understood, as these too are performed solely by the customer, once he has purchased the equipment.

### A CLOSER LOOK AT THE ‘MIL-STDS’

Rather than indulge in a point-by-point dissection of the proposed draft law, it would be more instructive to take a closer look at the concept of the Mil-Stds which, by default, are the underpinnings of all certification attempts.

Even a cursory look at the US Department of Defense (DoD) guidelines for certification/standardisation would reveal that they clearly define situations in which the standards are NOT to be applied. Premature drafting and the enforcement of rules for these categories are deemed to be against the interests of US government agencies. Those clauses effectively encapsulate most of the next generation technologies, and the retention of these exemptions is especially vital to enable the development of these new age platforms and product categories.

As per the US DoD framework within which the Mil-Stds are drafted/implemented, the individual acquisition programme managers of the customer are responsible for choosing which standards to apply or invoke. The spirit in which the Standards are drafted are for programme managers from the customer side to exploit/implement them as they see appropriate. This automatically breeds the necessary cost/time/effort consciousness, and promotes a responsible invocation of standards. It also implies that the primary penalties to the developer would be in the form of contractual provisions (suspension of contract, payments, encashment of bank guarantees, blacklisting, etc.) for which adequate provisions already exist. The replacement of this by a disinterested third party certification agency with quasi-judicial powers is clearly fraught with the risk of unnecessary prescriptions without considerations of efficiency.

### RECOMMENDATIONS

With the litany of core infirmities outlined, it would be clear that the current thrust of certification-related changes being attempted need a fresh relook. Major changes are necessary in the draft bill and, hence, it should be subject to detailed analysis/discussion. The industry perspective should be represented by a body like the Society of Indian Defence Manufacturers (SIDM), to enable frank feedback and fair representation of industry concerns without fear of retribution.

The structure/process of the certification programme, especially the parts relating to initial certification for release to service, should be aligned with the US DoD process as all the standards are drawn from that ecosystem.

The DAP clause requiring 'full certification' prior to SSCT must be reverted back to 'provisional clearance' sufficient for the demo—at least for the first sale of any new equipment. In order to infuse a responsible approach to 'certification', all costs associated with transitioning from provisional

certification to release to service must account as an NRE element in the acquisition contract *at actuals!*

The implementation of a level-playing field is a must with respect to foreign OEMs which are currently outside the scope of the proposed law. Failure to do so will encourage the absolute reverse of what is intended, that is, an encouragement to return to license manufacture, with even indigenous systems encouraged to present themselves as 'foreign', despite local manufacture/indigenous content. This would result in the design being classified as 'foreign' and, therefore, exempt from certification constraints, while possibly still being classified as having high 'indigenous' content due to local manufacture and component sourcing!