

Rapid Development of ACI Documents

Innovation Task Group process speeds technology acceptance into practice

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In 1993, the ACI Technical Activities Committee (TAC) formed the TAC Technology Transfer Committee (TTTC) to move proven, new technology into practice faster. As many active members of ACI committees well understand, committee members are often involved in multiple efforts and often work on more than one committee. The committee missions are quite broad, and all members of ACI who do the work of the committees are volunteers. As a result, new technology may take up to 20 years before it is adopted in an ACI document. While this is not true for all areas of technology, it is true for many. TAC wanted a new approach that reduced the time required to implement highly useful technology.

The mission of TTTC is simple: to *facilitate technology transfer*. TTTC accomplishes its mission through the presentation of technical sessions on cutting-edge technology at fall ACI conventions, by advising TAC on technology transfer matters, and through the operation of Innovation Task Groups (ITGs). The ITG process has been highly successful and represents a tool to help ACI incorporate the latest validated technology into practice by rapid development of consensus-based documents.

WHAT ARE ITGs AND WHAT DO THEY DO?

An ITG is a specialized ACI committee with a limited mission and lifetime. Its role is to evaluate new technology and, if appropriate, transfer that technology into one or more standardized documents.

To date, five ITGs have been formed, covering precast moment joinery, high relative rib area reinforcing bars, steel-free concrete bridge decks, the use of high-strength concrete in seismic applications, and precast shearwalls for seismic resistance. Work by ITG-1 and ITG-2 on the first two topics is complete. Of special interest is the effort by ITG-1 in developing "Acceptance Criteria for Moment Frames Based on Structural Testing and Commentary (ACI T1.1/T1.1R-01)." The document was originally approved as a *provisional standard* in 1999 and played an important role in the 2000 International Building Code (IBC) by establishing criteria for building frames subjected to seismic loading. The rapid development process available through ITGs allowed the IBC to adopt acceptance criteria that are applicable to any structural material. Had ACI

T1.1 not been developed in a timely manner, a special advantage could have developed for structural steel. ITG-1 has since completed work on a second document, "Special Hybrid Moment Frames Composed of Discretely Jointed Precast and Post-Tensioned Concrete Members and Commentary (ACI T1.2/T1.2-03)," which defines design requirements for these types of frames.

ITG-2 developed a standardized document on "Splice and Development Length of High Relative Rib Area Reinforcing Bars in Tension (ACI T2-98)." Originally a provisional standard, it has now completed the normal standardization process and has been adopted by ACI Committee 408, Bond and Development of Reinforcement, as ACI 408.3-01.

ITG-3 is currently finalizing a guide on steel-free concrete deck systems, and the newest ITGs—ITG-4, on the use of high-strength concrete for seismic applications, and ITG-5, on the use of precast shearwalls for high seismic applications—began their work in 2003.

WHO ARE THE MEMBERS OF AN ITG AND HOW DOES IT OPERATE?

An ITG consists of at least five members. It is chaired by a member of TTTC and includes members of the ACI technical committee(s) that will maintain the document(s) once development is complete. The typical life of an ITG is 2 to 3 years. ITG documents are balloted and approved much like any ACI document, but the balloting process includes the participation of three voting reviewers who are not members of the ITG. The intent of the ITG review is to allow a broad range of interest groups to participate in the document development through the ACI consensus process. After ITG approval, documents proceed to review by TAC and to full standardization. Depending on the subject matter, a document may be approved first as a provisional standard, which shortens initial standardization by 6 to 24 months. The use of the provisional standardization process was critical in the development of ACI T1.1, as previously mentioned, allowing it to be referenced in the 2000 IBC.

If, during the process of preparing the standardized document, the ITG determines that there is insufficient performance history to write a comprehensive document,

it may recommend that the document be published as part of the Emerging Technology Series (ETS). As stipulated in the *ACI Technical Committee Manual*, an ETS document includes a statement of limitations and discusses research needs. ETS documents have a maximum lifetime of 10 years, at which point the responsible committee must make major revisions or withdraw the document.

HOW DO ITGs AND ACI COMMITTEES WORK TOGETHER?

Members of ACI committees participate in the work of ITGs, and the committees provide a permanent home for ITG documents. ITGs support the work of committees through the rapid development of standardized documents.

HOW IS AN ITG FORMED?

The ITG process is stipulated in the *ACI Technical Committee Manual*, which governs operation of ACI technical committees and development of ACI documents. The process starts when an interested party submits a request for document development to the TTTC and ACI's Managing Director of Engineering. The request should identify the new technology; describe its advantages over existing technology; summarize its state of development, testing, and evaluation; and identify the type of standardized document to be produced by an ITG, such as a test method, guide, or specification.

Upon receipt of the request, the TTTC Chair appoints a task committee to review the request and recommend whether an ITG should be appointed. The task committee addresses the following questions:

- Will a document on the new technology fit within ACI's general mission?
- Does the new technology provide advantages over existing technology?
- Are there competing technologies?
- Do technical papers or research reports adequately document the new technology?
- Is the new technology mature enough to proceed with the development of an ACI document?
- Does the task committee recommend formation of an ITG?

If the task committee recommends against forming an ITG, the TTTC will inform the submitting party and TAC of the decision and supply a brief report.

On the other hand, if formation is recommended by the task committee and subsequently approved by TTTC and TAC, the TTTC Chair appoints an ITG to evaluate the new technology and prepare a draft document. Once formed, the new ITG's mission is publicized to the ACI membership by an announcement in *Concrete International*.

An ITG's charge includes a general description of the technology to be evaluated, the standardized document(s) to be produced, and a tentative time schedule for the effort. At this stage in the development, TTTC identifies a technical committee within ACI that will maintain the document once

the work of the ITG is complete. Typically, members of that committee are appointed to the ITG and close coordination is maintained between the ITG and the committee that will serve as a future home once the document has been developed, balloted, and standardized.

To facilitate development of a document, an interested party may provide funding, via ACI, to support meetings of the ITG or provide honoraria for the principal drafters of the document, or both. If outside funding is not available, the TTTC Chair may request funding from ACI to support these costs.

The Chair of the ITG provides updates to the TTTC at each ACI convention and more frequently if requested.

WHAT HAPPENS WHEN THE WORK OF AN ITG IS COMPLETED?

After completion of the normal standardization process (public comment and approval by the ACI Standards Board), or publication in the case of an ETS document, responsibility for the document is transferred to an ACI technical committee and the ITG is discharged. The technical committee is then responsible for maintenance of the document in accordance with procedures stipulated in the *ACI Technical Committee Manual*.

SUMMARY

ACI has taken several steps to permit technology to be transferred more rapidly than in the past. ITGs, with their limited mission and lifetime, represent one of the tools for accomplishing this goal through the rapid development of standardized ACI documents. It is a tool that the developers of new technology and ACI committees would be wise to adopt.

Selected for reader interest by the editors.



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