Third-party tool development guidelines

Downhole measurements form an integral part of the technology that is routinely used in ODP. In addition to the standard downhole tools that are available on all ODP scientific legs, ODP has historically drawn upon tools developed outside the framework of its primary contractors. These tools are known as "third-party" tools.

Support for the development of third-party tools can come from a variety of sources. In the United States, third-party tool development has generally been supported by the National Science Foundation, using funds earmarked for ODP and allocated to highly ranked, unsolicited proposals. International partners operate a similar procedures.

Tools that are developed with this type of funding are specifically intended for deployment in ODP. However, scientists sometimes wish to use existing tools that have been developed externally for different purposes. In both cases, it is important that third-party tools are certified as satisfying all the operational and safety criteria that ODP applies to its own in-house tools.

Third-party tools are required to make a transition from the development stage to certification for deployment downhole in ODP under the management of either ODP Science or Logging Operator. To facilitate this transition, a set of guidelines has been formulated for the overall process of bringing third-party tools through development. The aim is to improve communications between ODP and those outside investigators who wish to develop a third-party tool, with the objective of preserving ODP's safe, secure, and scientifically beneficial operations.

In response to the revision of the ODP advisory structure, and the mandate of the Scientific Measurements Panel (SCIMP), the following guidelines for third-party tool development have been modified to reflect the fact that the Science (ODP/TAMU) and Logging Operators (ODP/LDEO-BRG) are responsible for assisting with and monitoring third-party tool developments and reporting status to SCIMP. These guidelines indicate a general progression through which new tools are introduced to ODP operations. More detailed technical specifications are available from the ODP Science Operator or Logging Contractor.

1. Classification
ODP defines three types of third-party tools: development tools, certified tools, and mature tools. A development tool is either a tool that is under development externally for use specifically in ODP or a tool that has been developed outside ODP for other purposes and is being considered for ODP deployment. A certified tool is a tool that has been developed outside ODP, either for specific ODP application or for other purposes, and is now deemed to satisfy all the criteria for scientific deployment in ODP. Where there is likely to be a long-term requirement for the data provided by a certified tool, it may be a candidate to become an ODP mature tool. A mature tool is an established tool that has become part of the range of tools operated routinely by the Science or Logging Operator. Such a tool will effectively be owned by ODP and will no longer be a third-party tool. Data acquired through the use of Third Party Tools (including mature tools only) are subject to the same dissemination rules as any other data collected onboard the JOIDES Resolution.

2. Development tool
For a tool to be considered a development tool, several criteria must be satisfied.

(1) There must be an identified Principal Investigator who is the primary proponent for the use of the tool in ODP.

(2) The Principal Investigator should formulate a development plan in consultation with the Science or Logging Operator, as appropriate.

(3) The development plan should:
- indicate the usefulness of the proposed measurements and the financial and technical feasibility of making them
- include a brief description of the tool, schematic diagram(s), details of the operational procedure, and technical specifications such as dimensions, weight, temperature and pressure ratings, cable-length restrictions, cable type, etc.
- identify development milestones in terms of both the level and the timing of technical achievements
- make provision for initial testing on land
- satisfy safety considerations
- specify shipboard requirements such as the data processing necessary to make the information accessible on board ship, any special facilities (emphasizing where the tool is not compatible with existing hardware and software), and appropriate technical support
- make provision for transporting tools for shipboard testing, in terms of both cost and time
- contain a signed (pro forma) statement of (a) agreement with these requirements and (b) intent that the tool would be available for post-development deployment in ODP.

(4) The development plan must be submitted for approval to the Science or Logging Operator as appropriate. The Science or Logging Operator liaison to SCIMP is responsible for reporting to SCIMP the submission of development plans. SCIMP will bear the responsibility of determining action on these submissions relative to the panel mandate and will provide advice regarding further tool development.

(5) If the Science or Logging Operator and SCIMP when appropriate endorses the development plan, a liaison will be appointed by the appropriate operator to monitor the tool's progress through the development plan. The operator's tool liaison will be charged with providing status reports of the tool's progress to SCIMP, via the panel liaison.

(6) An ODP development tool can be scheduled for testing during an upcoming leg. Development tools must be deployed in test mode. By their very definition they are not certified or mature tools, and therefore the scientific success of a leg should not be contingent upon the proper functioning of such a tool.

(7) Where it becomes apparent that the development plan is seriously behind schedule and that the tool is unlikely to have satisfied all the above criteria prior to its planned deployment, the shipboard test should be canceled and agreement reached on a revised schedule. In particular, if a

development tool has failed to satisfy all the above criteria six months before the start of the test leg, the Science or Logging Operator (as appropriate) has the right to withdraw the tool from further consideration for that leg.

(8) It is incumbent upon the Principal Investigator to ensure that the Science Operator or Logging Contractor, as appropriate, is fully advised of the tool's status before the six-month deadline.

(9) A tool cannot be regarded as an ODP development tool, and therefore cannot be scheduled for testing in future legs, if the above procedures have not been followed. A development tool cannot be deployed on an ODP leg unless the ODP Science Operator or the Logging Contractor are fully satisfied that the terms of the development plan have been fully met.

3. Certified tool
For a tool to be considered an ODP certified tool, the following criteria must be met.

(1) The tool must have satisfied all the requirements for an ODP development tool.

(2) The tool must have been tested at sea during ODP legs and performed satisfactorily in the opinion of the Science Operator or Logging Contractor.

(3) The Principal Investigator should formulate a request for certification in consultation with the Science Operator or Logging Contractor, as appropriate.

(4) The request for certification should:
- be prepared in coordination with the operator's SCIMP liaison (or designate) to ensure adequate communication between the developer and the operator
- indicate the cost of routine shipboard operations including data processing
- outline the operational requirements for routine deployment and data processing
- detail the availability of spare components
- provide information on adequate maintenance facilities
- include an operating and maintenance manual
- satisfy safety considerations
- confirm the long-term usefulness of the data
- provide source code with documentation
- define performance specifications (pressure, temperature, vibration, shock limits, etc.)

(5) The request for certification must be submitted for approval to the Science or Logging Operator.

(6) If the Science or Logging Operator and SCIMP when appropriate endorses the request for certification, a certificate confirming the satisfactory conclusion of tests and compliance with all requirements will be issued to the Principal Investigator. A copy of this certificate should be forwarded to the SCIMP chair.

(7) An ODP certified tool remains the charge of the third party. It can be scheduled for

deployment during an upcoming leg and would be expected to contribute to the scientific success of the leg.

(8) Tools that do not possess a certificate cannot be programmed for scientific deployment on future legs.

4. Mature tool
For a tool to be considered an ODP mature tool, the following criteria must be met.

(1) The tool must satisfy all the requirements for an ODP certified tool.

(2) A mature tool proposal should be submitted for approval to the Science or Logging Operator, as appropriate. SCIMP will be apprised of the submission of mature tool proposals and will advise the Science or Logging Operator on the long-term scientific benefits of the proposal.

(3) If the Science or Logging Operator and SCIMP endorses the mature tool proposal, on direction from JOI, the Science or Logging Operator will proceed toward acquisition of the tool for ODP.

(4) Required or desired changes to certified tools prior to granting mature tool status should be handled on a case-by-case basis, with advice from SCIMP.

(5) When several certified tools that perform the same function are competing for mature tool status, the Science or Logging Operator, with advice from SCIMP, will determine which of these tools is most appropriate for routine operation. The contractors are charged with providing regular status reports to SCIMP for their consideration and with seeking advice from SCIMP when appropriate.

(6) Tools that have not undergone this process cannot be adopted by ODP as mature tools and will therefore remain third-party tools.

5. Protocol for development
Prospective proponents of third-party tools are requested to contact the ODP Logging (for wireline tools) or ODP Science Operator (for all other downhole tools) at the earliest possible stage of their projects. This is to ensure communication between the developer and the operator as to operational specifications pertinent to tool development, and to identify redundant effort. Proponents will also be informed of the protocol governing the development and deployment of ODP third-party tools.