VERDUGO FIRE ACADEMY

Swift Water Rescue
First Responder

“Low Risk, Land Based Rescue Methods”
NFPA 1670

- **Standard on Operations and Training for Technical Search and Rescue Incidents**

- Three functional levels:
  - Awareness - Minimum capabilities.
  - Operations - Capable of hazard recognition, equipment use and rescue techniques.
  - Technician - Capable of Supervision, hazard recognition, equipment use and rescue techniques.
Project Goals

- Basic Knowledge / history of the flood control channels in the L.A. area
- Terminology
- Theory / Duties of a First Responder
- Safety
- Dispatch
**HYDROLOGY**

- River right
- River left
- Upstream
- Downstream
- Strainers
- Upstream V
- Downstream V
- Pillows
- Eddy
- Eddy Fence
- Standing wave
- Hydraulic
- Laminar flow
- Helical flow
Facts

- In the United States
  - Approximately 6,000 - 9,000 people die annual in water related emergencies
  - 1/3 of these drownings are would-be rescuers

- Within Los Angeles County Annually
  - 60 Swiftwater Incidents are handled by First Responders
Note:

This system is comprised of three major waterways consisting of over 450 miles of flood control channels, 2,000 miles of storm drains and tributaries channels.

- Three Main Rivers
  - Los Angeles
  - San Gabriel
  - Rio Hondo
Pre-Incident Planning

- Familiarity
- Type of Waterway
- Access
- Hazards
- Physical Features
- Pre-Determined Rescue Sites
- Anchor Points
Terminology

- Eddy
- Eddy Fence
- Hydraulic
- Strainer
- Standing Wave
- Pillow
- Laminar Flow
- Helical Flow
- Downstream “V”
- Upstream “V”
- Upstream
- Downstream
- River Right
- River Left
- Defensive Position
- Ferry angle
Strainer

- Buildup of debris such as rocks and logs which restrict downstream flow. Dangerous due to underwater currents/undertows which may cause entrapment and drowning.
STANDING
WAVE

HYDRAULIC

PILLOW
Channel Dividers

[Image of a channel with a divider]
Bridge Piers
Stair Steps – Gradient Drop
Hydraulic

This is one suggested method for escaping from a low head dam. The escaper should attempt to stay on the bottom and move downstream after being pulled down at the face of the dam. Ideally, this should allow him to surface below the boil, in the outwash. This is a very dangerous situation and there is a likelihood that debris may entrap the escaper along the bottom of the river.
Hydraulic
Laminar Flow

Fastest
Faster
Slower
Helical Flow
Defensive Position
Defensive Position
A Ferry Angle is a 45° angle to the current vector.
Ferry Angle

◆ 45° to current vector
◆ Backstroke position with head upstream toward desired bank angled 45° to current vector
VIDEO

NO WAY OUT!!!!!
Fifteen Absolutes Of Swift water Rescue

- Always wear PFD within 10’ of water
- Employ upstream spotters ideally both sides of water course
- Priorities:
  - Self rescue
  - Team rescue
  - Victim rescue
Fifteen Absolutes Of Swift water Rescue (Cont.)

- Have contingency plan
- Employ multiple downstream backups on both sides
- Keep it simple (KISS safety concept)
- Use correct equipment
- Never put feet down if swept away & swimming
- Never count on victim to do own rescue
Fifteen Absolutes Of Swift water Rescue (Cont.)

- Never put rope around rescuer
- Never tension line perpendicular across water course-Use tensioned diagonal rope
- Never stand inside rope bight-Stand on upstream side of rope
- Once victim is contacted, never lose him/her
- Given choice between fire helmet & no helmet-Choose no helmet
- Be proactive
Rescue Philosophy

- **Priority 1**: Self rescue (You are highest priority)
- **Priority 2**: Team rescue (Back up other rescue personnel)
- **Priority 3**: Rescue the victim (Use lowest risk method first)
L.A.S.T

In order to successfully complete the rescue, it is necessary to meet four objectives.

- L - Locate the victim.
- A - Access the victim.
- S - Stabilize and extricate the victim.
- T – Transport the victim.
Rescue Options
( Low Risk to High Risk)

- Communication: All Members
- Floatation: All Members
- Reach / Throw: First Responder
  - Land Based Options:
    - Throw Bag
    - Inflated Fire Hose
    - Tension Diagonal
- Row / Go / Tow: Swiftwater Team
- Helo: Specially Trained
DROP FROM A BRIDGE
Talk

- Low risk: Try to talk victim to self-rescue
Reach

- Low risk: from shore use a line, flotation ring, pole, stick or inflated hose line
Throw

- Low risk: use throw bag or rope to victim
Throw

Left click here to start video clip
Practice Throw Rescues

- Standing throw bag
- Moving throw bag
- In-water throw bag
Moderate risk: Use boat or board to reach victim (not for First Responders)
Go & Tow

- High risk: Enter water & swim to victim
  (Not for First Responders)
Helo

- High risk: Use helicopter to assist with rescue.
Tension Diagonal

- Ideal angle of tension diagonal
  45 degrees or less
Tension Diagonal

WRONG ANGLE

PROPER ANGLE
Tension Diagonal

Click here to start video clip
Inflated Fire Hose

- BRIDGE BASED
- PREFERRED HOSE
  - 2 1/2 INCH HOSE OR BYPASS
- ALTERNATE METHOD
  - THROW RING
Inflated Fire Hose

- Plug & Cap Hose
- Secure one end of hose with rope
- Inflate hose
- Secure rope to anchor point
- Lower hose over water
Inflated Fire Hose
Inflated Fire Hose

- DROP INTO VICTIMS LAP
- VICTIM WILL PENDULUM TO SHORE
- RESCUER ASSIST IN RECOVERY OF VICTIM
Inflated Fire Hose

Click here to start video clip
Throw Bag

- Rescuer throws bag up river 45°
- Victim will pendulum to shore
- Rescuer assist in recovery of victim
Throw Bag

- RESCUER WITH THROWBAG (THE THROWER) SHALL BE TETHERED
- RESCUER ASSISTING THE VICTIM (THE CATCHER) SHALL BE ON BELAY
Munter Hitch to Anchor Point
Brakebar Rack To Anchor Point
Throw Bag

Click here to start video clip
Safety

- AVOID AREAS OF BAD FOOTING
- MEMBERS WITHIN 10 FEET OF THE WATER SHOULD WEAR PFD's
- LIGHTWEIGHT HELMETS NO FIXED BRIMS
Safety

- NO TURNOUT BOOTS
- ABSOLUTELY NO TURNOUT CLOTHING OR EMS SAFETY JACKETS

River Rescue/Code 20
L.A. River at the Santa Monica Freeway Downtown L.A.

Four persons were rescued from the L.A. River by L.A. City firefighters and a L.A. County Sheriff's helicopter. East moving waters took the construction workers by surprise. Two were rescued via helicopter off their cement mixer and two were rescued from beneath a bridge after the cherry picker they were on was swept away from under them. Several other vehicles were also swept downstream in the flood waters. Twenty Fire Departments including L.A. County, Ventura Fire and Long Beach Fire took positions on bridges and pumping downstream to control the rising waters for any additional victims.

Photo and information by Martin Nada Raymond CIPA
Swift Water Dispatch

- **RIVER**
  - 3 ENGINES
  - 2 TASK FORCES
  - 1 RESCUE AMBULANCE
  - 2 HELICOPTERS
  - 1 A/C (Incident Commander)
  - 1 B/C (Rescue Group Supervisor)
  - 1 COMMAND POST COMPANY
  - 2 SWRT’S
  - US&R, Heavy Rescue
Swift Water Dispatch

- **RIVER 2**
  - 1 ENGINE
  - 1B/C (Incident Commander)
  - 1 HELICOPTER
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*1 - DIS LF2 AS COMMAND POST UNIT

*SWL- E56, HELO TO INC ADDR

*SWL- LF50 TO LOS FELIZ(F)

*SWL- E35 TO GLENDALE(F)

*SWL- TF1,RA26,LF2,E44,DC1,LF3,HR56,SWT1,SWT2,BC2,HELO TO MAIN(R)

*SW* VICTIM IN WATER AT 1602

WHITE JEEP CHEROKEE
Swift Water Lesson Learned

- Unify command & response
- Use common tactical radio frequency
- Get thorough witness information
- No turnouts due to immersion danger
Swift Water Lesson Learned

- Know bank stability & access to victim
- Must wear PFD within 10’ of water
- Implement downstream protection
- Throw-bags are critical rescue devices