Lesson Plan by Rob Earle

HOW TO SUCCESSFULLY TRANSIT A CRUISE WEST VESSEL THROUGH A LOCK ON THE COLUMBIA OR SNAKE RIVERS

Objective: At the end of the class, with the aid of oral and written information, the student will be able to:

1) identify the steps necessary to transit any lock on the Columbia and Snake Rivers;
2) apply local knowledge on the approach to and departure from each individual lock
3) plan a transit of any lock on the Rivers based on prevailing local conditions

I. Introduction: Unique conventions of The Rivers and the locks
- A. Inland Rules
- B. Use of statute miles, mph, and depth in feet
- C. Communications conventions
  1. Use of VHF channel 14 to communicate with locks
  2. Use of landmarks and waypoints not appearing on chart
  3. Directional conventions
     a. Below Bonneville (BVD), vessels travel "inbound" and "outbound."
     b. Above BVD, vessels travel "upbound" and "downbound."
- D. Lock and dam components
  1. Power house
  2. Spill way
  3. Navigational lock
     *How a navigational lock works
  4. The lock master
     a. Acts on authority of the project engineer, who is in overall charge of a lock and dam facility
     b. A civilian employee of the USACE
     c. *Charged with immediate control and management of the lock, and of the area set aside as the lock area... to the end of the wing or the guide wall, whichever is longer* except at BVD, where his or her authority extends to the upper end of Bradford Island.

II. Approach to lock
- A. Call on lock master on VHF 14 *at least one-half hour in advance of arrival.*
  1. This is the convention on The River, but it is appropriate to call earlier if conditions (fog, heavy traffic at lock, large numbers of fishing boats, etc.) demand.
  2. Call at Snake River RR Bridge when upbound for Ice Harbor.

3. Precedence at lock: *The vessel or tow arriving first at the lock will be locked through first, however, this precedence may be modified at the discretion of the lock master.*

a. If immediate passage is required, lockage of vessels owned or operated by the United States shall take precedence.

b. Recreational vessels at a scheduled recreational vessel lockage have precedence.

c. Note that precedence rules on The River are different from those at Ballard Locks or Sacramento Deep Water Channel Barge Lock.

B. On deck preparations

1. Rig mooring lines and fenders on appropriate side of the vessel

* Ideally, you'll have a standard mooring plan for each lock, adapted for prevailing conditions like other traffic in lock, wind, and wear and tear on lock fenders.

2. Safety – if necessary, "goat rope" off areas where deck hands will be working lines.

3. Bow thruster on line, wing station on line, etc. – it might help to have a checklist for this part!

C. If previously instructed, call lock master at a designated time or position.

D. If necessary to wait for other traffic, *stay in the clear outside of the lock approach channel* – in other words, stay out of the upper and lower basins without permission of the lock master.

E. Never enter without a "green light" – this ain't Ballard!

Remember: sometimes, you're just going to have a bad arrival!

III. Locking through

A. "How To Lock Through" handout

1. Mooring in lock

a. All vessels must be moored within the lock chamber so that no portion of any vessel extends beyond the lines painted on the lock walls.

b. Moorage within the lock chamber will be to floating mooring bits only and will be accomplished in a proper no-slip manner.

c. The vessel operator will constantly monitor the position of his vessel and his mooring bit ties to assure that there is no fore or aft movement of his vessel and lateral movement is minimized.

d. Propulsion by vessels within the lock chamber will not be permitted during closure of a lock chamber gate or as otherwise directed by the Lock Master.

2. Operator's responsibilities:

a. Constantly attend wheelhouse

b. Be aware of vessel's position

c. Monitor VHF ch. 14

d. At a minimum, vessels shall be as vigilantly manned as if underway.

3. Speed
    - *a. Vessels shall be adequately powered to maintain a safe speed and be under control at all times.*
    - *b. As a general rule, when a number of vessels are entering the lock, the following vessel shall remain at least 200 feet astern of the vessel ahead.*
4. Miscellaneous rules
    - a. Do not unnecessarily delay any operation of the locks
    - b. No transfer of freight, passengers, baggage, etc.
    - c. No damage to lock or other structures
    - d. No refuse in locks
    - e. No handling of machinery, etc
    - f. No entering restricted areas.

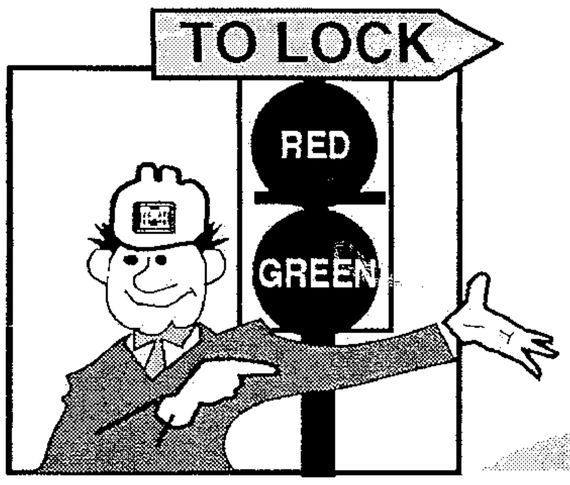
B.Multiple-vessel lockages
1. At discretion of lock master
2. Not allowed with flammable or hazardous cargo

IV. Departure
- A. Conditions may have changed since you entered the lock! (wind, visibility, traffic waiting, etc.)
- B. Do not exit until you get the okay from the lock master – this will almost always be by VHF (compare to entering the lock…)
- C. Run your checklist – especially regarding comms with deck staff
- D. At some locks, you will have another evolution or tricky navigation situation immediately following departure from the locks:
    - a. Bonneville upbound: docking at Bradford Island
    - b. Ice Harbor downbound: Ice Harbor cut
    - c. John Day downbound: Preacher's Eddy backrange
    - d. The Dalles downbound: The Dalles docking

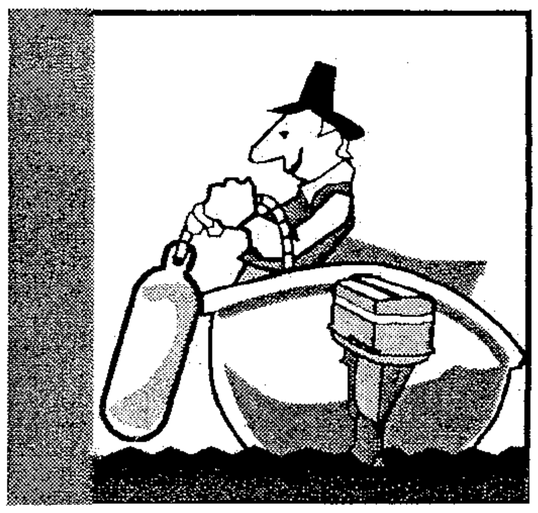
Remember: sometimes, you're just going to have a bad departure!

V. Exercise – Locking through Bonneville.

How To Lock Through

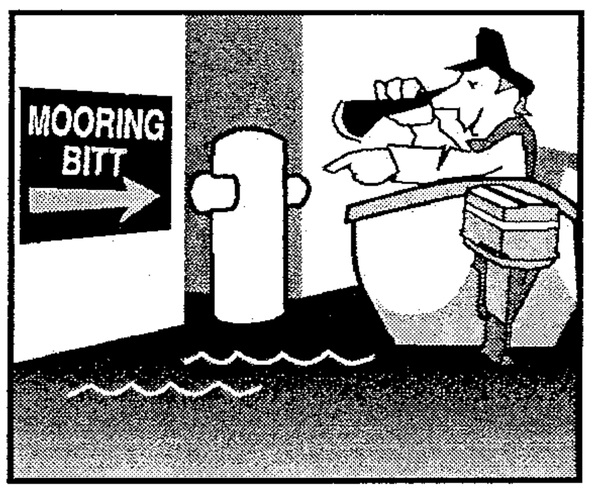


1
Ask permission from the lock operator to enter the lock via intercom or radio. Wait to be notified by intercom or radio, and horn or light signals to proceed.

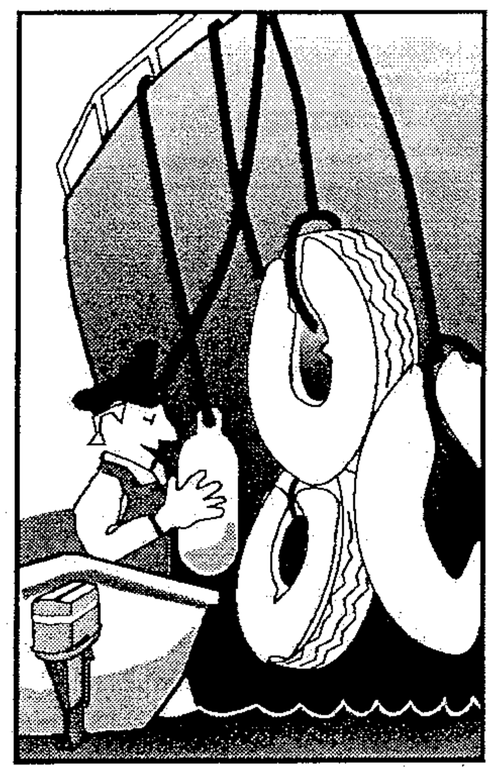


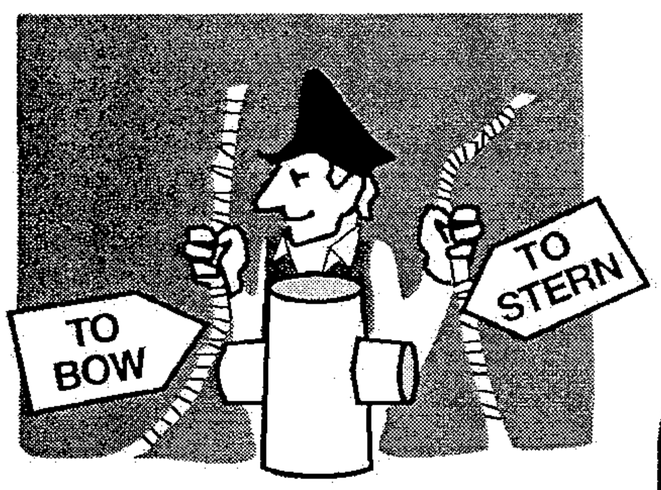
2
Proceed into the lock and place fenders fore and aft on side of vessel high enough to protect the outermost edge of vessel.

3
Tie up at the mooring bitt designated by the lock operator. Position your vessel so the mooring bitt is located amidship.

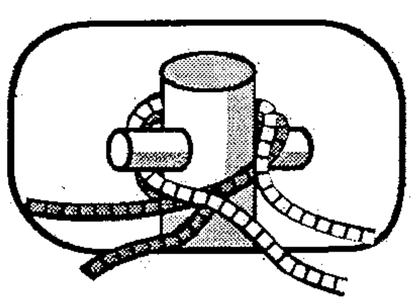


4
If there are several vessels in the lock, you may be instructed to tie alongside a craft already secured to one of the mooring bitts.

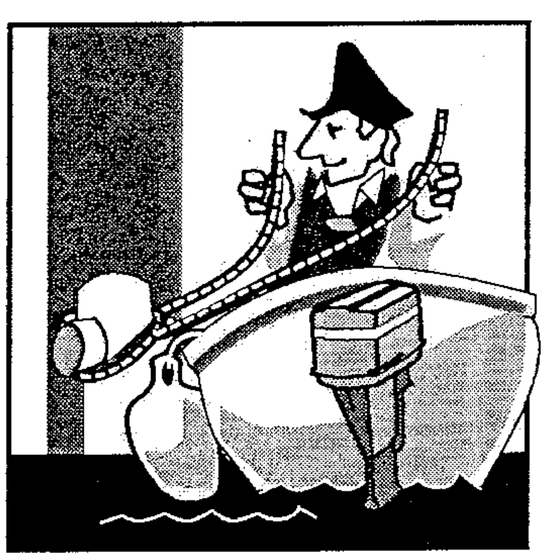




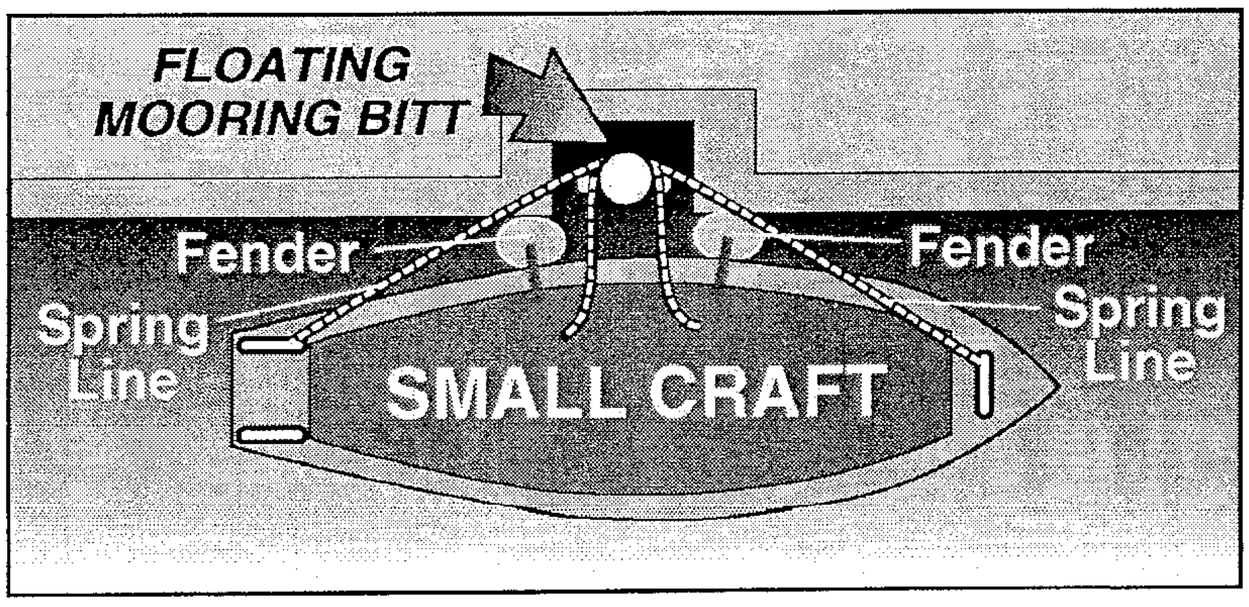
5
Use two spring lines, one from the bow and one from the stern.



6
Secure both lines around the mooring bitt and remain alert in case the bitt gets stuck and you need to release the lines quickly.
Please remain secured to bitt until told to proceed.



7
View of final mooring position of your vessel for safe lockage.



US Army Corps of Engineers ®

Keep careful watch throughout the lockage!

In an emergency, you could be notified to quickly release your vessel from the mooring bitt.

ALWAYS WEAR YOUR LIFE JACKET

Bonneville WUJ-33
Columbia River Mile 145.4

Inside Dimensions:	86 x 675 feet
Maximum Lift:	70 feet
Upstream Gate type:	miter
Downstream Gate type:	miter
Lower Lock Sill elev:	16.0 feet
Minimum depth over lower sill:	21 feet
Normal max. pool elevation:	74.0 feet
Minimum pool elevation:	70.0 feet
Upper lock sill elevation:	40.0 feet
Normal depth over upper sill:	34.0 feet
Minimum depth over upper sill:	30.0 feet
Upbound CIP:	Skamania Light
Downbound CIP:	Stevenson

Local knowledge:

Large numbers of recreational fishermen sometimes gather in Hamilton Island Reach. If so, wait for outbound traffic below McGowans, especially in heavy current.

In heavy current, maximum effect will be felt abeam Ives Island

Pass outbound traffic starboard to starboard above light "91"

Watch the set toward the "Barrell"

Downbound tugs will frequently wait at the barge tie-offs at Fort Rains (CR Mile 146.5).

Be sure and let downbound traffic know if you're headed for the sternwheeler dock at Bradford Island.

When downbound, watch the set toward the powerhouse once you approach the upper basin.

The Dalles WUJ-34
Columbia River Mile 191.8

Inside Dimensions:	86 x 675 feet
Maximum Lift:	90 feet
Upstream Gate type:	tainter
Downstream Gate type:	miter
Lower Lock Sill elev:	54.5 feet
Minimum depth over lower sill:	15.5 feet
Normal max. pool elevation:	160.0 feet
Minimum pool elevation:	155.0 feet
Upper lock sill elevation:	140.0 feet
Normal depth over upper sill:	20.0 feet
Minimum depth over upper sill:	15.0 feet
Upbound CIP:	Squally Pt.
Downbound CIP:	Brown's Island

Local knowledge:

No wake at The Dalles Marina

Wait for downbound traffic at Frenchies (CR Mile 190). Traffic coming out of the lock will want to pass starboard to starboard.

If a long wait seems in the offing, slow bell once above Rock Island (the power lines) – it's a lot easier than trying to hold station.

Watch the set on approach to the lower basin; have someone watching your stern.

Never cut the green can ("69"). Yeah, we all thought that went without saying, too…

This is the slowest-filling and emptying lock.

John Day WUJ-35
Columbia River Mile 216.5

Inside Dimensions:	86 x 669 feet
Maximum Lift:	113 feet
Upstream Gate type:	sub lift
Downstream Gate type:	vertical lift
Lower Lock Sill elev:	140.0 feet
Minimum depth over lower sill:	15.0 feet
Normal max. pool elevation:	265.0 feet
Minimum pool elevation:	257.0 feet
Upper lock sill elevation:	242.0 feet
Normal depth over upper sill:	23.0 feet
Minimum depth over upper sill:	15.0 feet
Upbound CIP:	Maryhill
Downbound CIP:	Hook

Local knowledge:

Nicknamed "John Delay" for a reason; not unusual to have lots of traffic here.

If there is lots of traffic, consider calling in early ("I'd like to throw my name in the hat.")

Wait for downbound traffic below green buoy "45". There's plenty of water 1 or 2 boards south of the range. Never try to meet traffic on the range.

If upbound against current be prepared for a good set to the Washington side. Be prepared to do some serious crabbing up the range.

With strong current, there is a strong back eddy just off the end of the lower guide wall. Upbound, your bow will already be behind the wall and the back eddy will brag your stern and force it toward the wall.

Don't wait in the lower basin for downbound traffic until you have discussed it in detail with the other operator and the lock master.

Downbound, watch the set toward the rock awash marked by Fl G 2.5s "1"

McNary WUJ-41
Columbia River Mile 292.0

Inside Dimensions:	86 x 675 feet
Maximum Lift:	83 feet
Upstream Gate type:	miter
Downstream Gate type:	miter
Lower Lock Sill elev:	236.0 feet
Minimum depth over lower sill:	21.0 feet
Normal max. pool elevation:	340.0 feet
Minimum pool elevation:	335.0 feet
Upper lock sill elevation:	320.0 feet
Normal depth over upper sill:	20.0 feet
Minimum depth over upper sill:	15.0 feet
Upbound CIP:	Lake Umatilla #70
Downbound CIP:	Hat Rock

Local knowledge:

A back eddy, similar to the one below John Day, occurs during strong currents just below the end of the guide wall.

When downbound, NW winds can catch you by surprise as you come out from behind the levee and into the lock.

Listen carefully to tug traffic here: a lot of it goes *across* the river from the barge tie up on the Oregon side (Umatilla).

Ice Harbor WUJ-42
Snake River Mile 9.5

Inside Dimensions:	86 x 665 feet
Maximum Lift:	103 feet
Upstream Gate type:	tainter
Downstream Gate type:	vertical lift
Lower Lock Sill elev:	321.0 feet
Minimum depth over lower sill:	14.0 feet
Normal max. pool elevation:	440.0 feet
Minimum pool elevation:	437.0 feet
Upper lock sill elevation:	422.5 feet
Normal depth over upper sill:	18.0 feet
Minimum depth over upper sill:	15.0 feet
Upbound CIP:	Snake River RR Bridge
Downbound CIP:	Dalton Lake

Local knowledge:

Note "early" call out at Snake River RR Bridge

If there's fog or traffic in The Cut, wait at Burbank (if upbound) or above the lock (if downbound) until it clears.

If heavy current in The Cut, slightly favor red side.

Lock master will ask for a second call at buoy "18" if upbound

If heavy current, watch for rough water and set toward the bank just below end of lower guide wall.

Snake River locks fill and empty faster and more forcefully than those on the Columbia. Vessel may heel a bit and one end may be pushed out when filling.

Log boom area on chart above lock no longer exists.

Snake River lock masters will ask for ETA to next lock.

Lower Monumental ("LoMo") WUJ-43
Snake River Mile 41.4

Inside Dimensions:	86 x 666 feet
Maximum Lift:	103 feet
Upstream Gate type:	sub lift
Downstream Gate type:	vertical lift
Lower Lock Sill elev:	422 feet
Minimum depth over lower sill:	15.0 feet
Normal max. pool elevation:	540.0 feet
Minimum pool elevation:	537.0 feet
Upper lock sill elevation:	522.0 feet
Normal depth over upper sill:	19.0 feet
Minimum depth over upper sill:	15.0 feet
Upbound CIP:	Burr Canyon
Downbound CIP:	Lake Herbert G. West #13

Local knowledge:

Watch set toward bank below end of lower guide wall

Tie off to south wall when transiting in either direction; large chunks of concrete have sloughed off north wall.

Little Goose WUJ-44
Snake River Mile 70.3

Inside Dimensions:	86 x 668 feet
Maximum Lift:	101 feet
Upstream Gate type:	tainter
Downstream Gate type:	miter
Lower Lock Sill elev:	518.0 feet
Minimum depth over lower sill:	15.0 feet
Normal max. pool elevation:	638.0 feet
Minimum pool elevation:	633.0 feet
Upper lock sill elevation:	618.0 feet
Normal depth over upper sill:	20.0 feet
Minimum depth over upper sill:	15.0 feet
Upbound CIP:	Mouth of Tucannon River
Downbound CIP:	New York Island ("Bunny Island")

Local knowledge:

Watch for uncharted shoaling NW of the 14-ft sounding approx. 350 yards west of the lower end guide wall.

Lower Granite WUJ-45
Snake River Mile 107.5

Inside Dimensions:	86 x 675 feet
Maximum Lift:	105 feet
Upstream Gate type:	tainter
Downstream Gate type:	miter
Lower Lock Sill elev:	618.0 feet
Minimum depth over lower sill:	15.0 feet
Normal max. pool elevation:	738.0 feet
Minimum pool elevation:	733.0 feet
Upper lock sill elevation:	718.0 feet
Normal depth over upper sill:	20.0 feet
Minimum depth over upper sill:	15.0 feet
Upbound CIP:	Upper end Schultz Bar or Boyer Marina (if stopping there)
Downbound CIP:	Granite Pt.

Local knowledge:

Call before departing Boyer Park if stopping there.

Meet downbound traffic between Boyer and the unlit buoy below the dam.

Watch for a sometimes strong back eddy setting you toward the guide wall on the lower end.

Large logs may collect in lock chamber and upper basin.

Lock master will ask for return ETA the next night.

Terrain interferes with VHF above lock – you may have to get closer than 30 min out on downbound. This is usually not a problem.